Medical Lib

Virginia Medical Monthly

OFFICIAL ORGAN OF THE MEDICAL SOCIETY OF VIRGINIA

Fifty-fourth Annual Meeting, Roanoke, October 16-19, 1923.

Vol. 51, No. 2.
WHOLE No. 851.

RICHMOND, VA., MAY, 1923

$2.00 A YEAR
20 CENTS A COPY

CONTENTS.

ORIGINAL COMMUNICATIONS:

Some Reactions in the Treatment of Syphilis and their Probable Significances. S. G. Gill, A. B., M. D., Norfolk, Va. ---- 71

Lumbar Puncture in the Routine Treatment of Syphilis. Warren T. Vaughan, M. D., Richmond, Va. ---- 75

A Plea for a more Comprehensive View of the Correlations in the Study of Medicine. J. H. Riden, M. D., Pungoteague, Va. ---- 79

Prenatal Care and Treatment. Robert P. Kelly, M. D., Lynchburg, Va. ---- 82

Cancer, the Tribulus Terrestris of Diseases. Stephen Harnsberger, M. D., Warrenton, Va. ---- 85

Obstetrics a Neglected Science and Art. George Thomas Myers, M. D., Norfolk, Va. ---- 86

Latent Maxillary Sinusitis. J. Warren White, A. B., M. D., Norfolk, Va. ---- 90

Art as Applied to Anatomy. John Wilkins Brodnax, M. D., Richmond, Va. ---- 92

The Relation of Biology to Surgery. J. Shelton Horsley, M. D., Richmond, Va. ---- 101

The Relationship of the Eye to General Diseases. G. B. Dudley, Jr., M. D., Martinsville, Va. ---- 110

Planning a Hospital in a Chinese City. Claude M. Lee, M. D., St. Andrew's Hospital, Wusih, China. ---- 114

Phlyctenular Kerato-Conjunctivitis. Sidney Trattner, M. D., Richmond, Va. ---- 117

After Care of Obstetric Patients. C. J. Andrews, M. D., F. A. C. S., Norfolk, Va. ---- 122

The Diagnosis of Tuberculosis in Childhood. Frank B. Stafford, M. D., Blue Ridge Sanatorium, Charlottesville, Va. ---- 124

Newer Methods of Determining Condition of Nutrition in in Children. Samuel Newman, M. D. ---- 127

A Preliminary note on Personal Experience in the Use of Insulin. Alexander G. Brown, Jr. M. D., Richmond, Va. ---- 129

ANALYSES, SELECTIONS, ETC. ---- 131

THE TRUTH ABOUT MEDICINE ---- 133

BOOK ANNOUNCEMENTS ---- 134

EDITORIAL ---- 135

NEWS NOTES ---- 138

OBITUARY ---- 146

FOR MEDICAL SOCIETY ANNOUNCEMENTS SEE PAGE 4.

INDEX OF ADVERTISERS—Advertising Page 5.

CALCREOSE

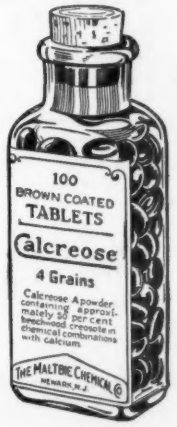
Creosote in Pulmonary Tuberculosis

Powell, Latham, Ransome and other clinicians who have given the treatment of pulmonary tuberculosis special attention are of the opinion that creosote not only produces a beneficial effect on the digestive organs, and, so, on general nutrition, but also is of undoubted value in lessening the cough and the amount of expectoration.

CALCREOSE (calcium creosotate) is a mixture containing in loose chemical combination approximately equal weights of creosote and lime.

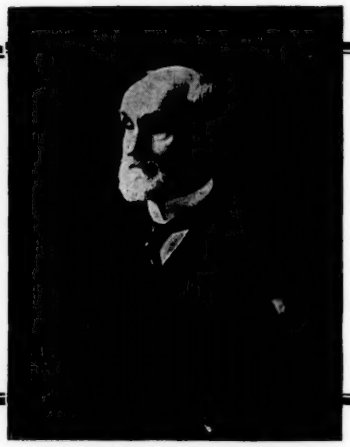
CALCREOSE has the pharmacologic action of creosote but does not have the untoward effects on the digestive tract that creosote has. Patients do not object to taking CALCREOSE.

Write for the "Calcreose Detail Man."



THE MALTBIE CHEMICAL COMPANY
Newark, New Jersey

He Paved the Way for your Financial Independence



Francis H. Smith: 1829-1906
Founder of The F. H. Smith Company

Fifty years ago the late Francis H. Smith, who was then employed in the House of Representatives and also a member of the commission appointed by President Grant to settle the Sioux Indian disputes, decided to go into business for himself.

Born and raised on a farm in Connecticut, he knew that the foundation of all wealth was land. He knew, furthermore, that the presence of the National Government in Washington, D. C., was **a guarantee of constantly increasing real estate values.** He knew that money would be needed to finance the Capital's expansion.

Started in 1873

So it was, in 1873, that Francis H. Smith opened an office and engaged in the real estate mortgage loan and investment business.

In 1873 there were no apartment houses in Washington and only thirty-three small hotels. Today there are approximately a thousand handsome apartment structures and some one hundred and twenty-five hotels, which rank with the best to be found in any city in the world.

Developing Washington

The F. H. Smith Company has played its part in this work of development. Buildings like these necessarily had to be financed in order to be built. Such financing in the majority of cases has been in the form of mortgage loans.

It is these loans—loans on apartments, hotels, office buildings, etc.—that are offered by us to the investing public in the form of First Mortgage Bonds. The security back of them is Washington real estate—improved, income-producing property.

Safe for 50 Years

Our First Mortgage Investments have behind them a record of **no loss to any investor in fifty years.** Funds may be invested for as short a period as two years or as long as fifteen years, in denominations of $100, $500 and $1,000.

The interest return of 6½% is made all the more attractive by definite tax free features.

Our Investment Savings Plan puts these investments within the reach of every-one who can save even as little as $10 a month.

Let us send you a free copy of our Golden Anniversary booklet. It contains the illustrated story of F. H. Smith's remarkable career and of one of the most interesting periods in the Nation's Capital.

The F. H. Smith Company,
Washington, D. C.

Without any obligation on my part, you may send me your Golden Anniversary booklet, together with information about first mortgage investments in the Nation's Capital.

8

Name.....

Street Address.....

City.....

The F.H.SMITH CO.

Founded 1873

FIRST MORTGAGE INVESTMENTS
WASHINGTON, D. C.

NO LOSS TO ANY INVESTOR IN 50 YEARS

Fifty-fourth Annual Session, Roanoke, Va., October 16-17, 1923.

Virginia Medical Monthly

Official Organ of the Medical Society of Virginia

Vol 50, No. 2.
WHOLE No. 851.

RICHMOND, VA., MAY 1923.

20 CENTS A COPY
$2.00 A YEAR

Original Communications

SOME REACTIONS IN THE TREATMENT OF SYPHILIS AND THEIR PROBABLE SIGNIFICANCES.*

By S. G. GILL, A. B., M. D., Norfolk, Va.

The tendency in the recent treatment of syphilis is to render the drugs easier of administration; to cause less reaction to the patient, and at the same time to promote sufficient treponemicidal activity on the spirochaetae pallidae.

Our experience in the treatment of many luetic cases has convinced us that the more arsphenamin has been adulterated or changed to try to meet these requirements, the less potent has become the drug in its therapeutic effects, both clinically and serologically.

Thus, in a large number of cases of secondary and tertiary syphilis treated with as many as eight injections of the various compounds of arsphenamin and fifteen injections of mercury, the Wassermann has become unaffected or to a greater degree positive, while similar conditions treated at the same time with arsphenamin, there has been a more marked clearing up of lesions and symptoms and an appreciable percentage of persistent negative Wassermann tests. We came upon this conclusion on experimentation of cases that were serologically and clinically as similar as possible with due regard to previous treatments, if any, and length of the disease.

Neo-arsphenamin has been condemned by public assent and relegated to a secondary place in the rank of arsenicals.[1] However, on account of its comparatively low toxicity and freedom from severe reactions, we have found it useful in certain cases.

In the treatment of debilitated syphilitics—especially those persons suffering with concomitant tuberculosis, of which we have many, or valvular diseases, or even when they are weakened by the ravages of syphilis itself—we have found it profitable to carry them through a course of neo-arsphenamin and mercury until they have regained enough strength to react properly to arsphenamin.

Silver salvarsan is passing through a hectic period of diversified opinion as to its efficacy. To date it is impossible to arrive at a definite conclusion as to its efficiency.

Arsphenamin and its substitutes, for subcutaneous injection, have already been studied experimentally.[2]

Mercury in many forms has been used in the treatment of syphilis, as rubs, intramuscularly, inhalations, internally and intravenously. Of late the intravenous methods of administration seem to have met with success by several prominent syphilographers and bacteriologists.

Thus it is interesting to note that arsphenamin and its compounds, as well as mercury in its different forms, are running the gamut of new compositions and of varied methods of administration.

Having already rendered arsphenamin easier of administration by using a few simple additions to the salvarsan gravity apparatus,[3] we tried to experiment with the two other main issues in successful treatment, viz.—"to cause less reaction to the patient and at the same time to promote sufficient treponemicidal activity on the spirochaetae pallidae."

In order to try to eliminate some of the reactions, we tabulated them in a series of over one thousand administrations of arsphenamin and neo-arsphenamin in various dosages. In our series we found that we had better clinical and serological results in those that showed reactions to the drugs, but in some cases we were able to eliminate or ameliorate the unnecessary reactions.

General Classification of Reactions.

The reactions are classified as to male and female and the following types:

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31—November 3, 1922.

1. Nitritoid, or those that showed vasodilatation, or immediate reactions.
2. Vomiting.
3. Chills and fever.
4. Diarrhea.
5. Slight malaise.
6. Severe.
7. No reaction.

The arsphenamin was administered by gravity and modification of gravity, and the neo-arsphenamin was diluted to make 10 c.c. of solution.

After thoroughly testing out both methods of administration of arsphenamin, we found no appreciable difference in the reactions. A slightly concentrated solution was used because we had only one available table, and many patients to treat. In debilitated patients, as stated before, we first used neo-arsphenamin, but later on, when the patient's condition became stronger, used either drug. Some cases were given one drug through a whole course, and some the other respectively.

In 473 injections of arsphenamin given to men, 358 had no reaction, and 115 or 24% had reactions of some description. In 226 injections of arsphenamin given to women, 145 had no reaction and 81 or 35% had reactions.

In 170 injections of neo-arsphenamin given to men, 136 showed no reaction, and 34 or 2% showed reactions. In 223 injections of neo-arsphenamin given to women, 143 gave no reactions and 80 or 35% had reactions.

It is interesting to note that we had more reactions in women and that they showed the same percentage of reactions to arsphenamin and neo-arsphenamin.

Nitritoid Reactions.—Nitritoid reactions occurred more often in women and in some cases were unaffected by dosage or method of administration. Of the sixteen such reactions in women, we found definite lack of ovarian secretion, either caused by previous operations or diseases of these organs. By the internal administration of ovarian substance, beginning five days before subsequent administration, we were able to eliminate this reaction in about 90% of these cases. As examples of this we will relate two cases: On March 14, 1922, two women had severe nitritoid reactions from .6 gms. neo-arsphenamin. Both these subjects had had their ovaries removed some years previous. Ovarian substance was prescribed for both of them and with the following tabulated results. March 21, 1922, neither had any reaction from .6 gms. neo-arsphenamin. March 28, neither had reaction from .4 gms. arsphenamin. April 3, neither had any reaction from .6 gms. neo-arsphenamin. On April 11, 1922, no reaction from .4 gms. arsphenamin, and so on until May 9, 1922, when one of them had a severe nitritoid reaction from .6 gms. neo-arsphenamin. This woman had discontinued taking her ovarian substance a few days previous.

Although the nitritoid reaction has never proved a serious one and usually can be readily controlled by the hypodermic administration of adrenalin, it is very distressing to the patient and also delays the physician when he has a large number of patients to treat in a short time. We have lately made it a rule to particularly get a history from every woman applying for treatment in regard to her previous operations and her menstrual condition.

There is one more case in this series that is probably interesting. Mrs. T., whose husband had recently died of neurosyphilis, had a 4+ Wassermann test May 16, 1922. This was about her usual time to menstruate. She received nine injections, .6 gms. neo-arsphenamin and nine injections mercury between this date and August 1, 1922, during which time she had had no menses. She had no reaction until the last injection August 1, 1922, at which time she had a marked nitritoid reaction, and one day afterwards her menstrual flow commenced. We assumed that the internal secretion of her ovaries was sufficient up to the time of her ninth injection. It may appear to some that we have laid too much stress on organotherapy in combating nitritoid reactions in these women, yet it has proven more satisfactory than the previous hypodermic administration of adrenalin.

Nitritoid reactions in men, in our series, were not as severe as those in women. Of the eleven cases we had, all were easily controlled by the hypodermic injection of adrenalin.

Vomiting.—In our series vomiting was the most consistent form of reaction with the exception of slight malaise. Some cases reacted at once, and others a few hours after the injection. Thirty out of 473 injections of arsphenamin in men, or 6%, had this reaction. Forty of the 226 women injected with arsphenamin, or 17%, vomited. Fifteen out of 170 men injected with neo-arsphenamin, or 8%, and 20 out of 223 women injected with neo-

arsphenamin, or 8%, vomited. A large number of these cases were from the City Jail and, although given proper instructions as to diet, several of them paid no attention to directions at all. A certain percentage of these cases ate fruit several hours or just before the administration of the drug. We found that the ingestion of acid fruits and the condition of having overloaded stomachs probably caused the majority of these reactions; however, there were some patients who had this reaction notwithstanding the fact that they apparently carried out our instructions as to diet.

Chills and Fever, Diarrhea and Malaise.—Chills and fever, diarrhea and malaise were reactions that we did not consider of much importance. The liberation of toxins from the destruction of the spirochetes would necessarily cause a reaction and in proportion to the amount of secondary eruption or localized infection.

The percentage of cases having malaise were as follows:—

42, or 8%, in arsphenamin to men.
25, or 11%, in arsphenamin to women.
11, or 6%, in neo-arsphenamin to men.
41, or 18%, in neo-arsphenamin to women.

Severe Reactions.—Of the five severe reactions we were able to tabulate, the outstanding significance is that the Wassermann test became negative; and of the four with whom we have kept in touch, none has as yet showed a reversion to a positive test. It is true that we have only had these cases under observation for from five to nine months after their severe reactions. All these cases are in good clinical condition; however, we realize that a further study is necessary.

We have had the idea and the conviction for some time that the ideal treatment for syphilis would be to give as large doses of arsphenamin as the patients can tolerate. A reaction is more to be desired than condemned, provided the incidental, useless causes can be eliminated. These causes would embrace a large variety of functional and organic conditions that could be treated in order to enable a larger dose of arsphenamin to be administered.

Insufficient treatment of syphilis is worse at times than no treatment at all. "Ehrlich's explanation of neurorecurrence is based on the theory of a sterilization which just falls short of being complete."[4]

It has been our experience in the treatment of syphilis with arsphenamin that we will get reactions quite frequently if a large dose is given. We have found, however, that the results justify maximum doses, provided one has the facilities for after treatment and for proper care of the patient. We, therefore, recommend maximum doses of arsphenamin for syphilitic patients when it can be tolerated, but strongly advise individual treatment to meet the existing conditions of the patient.

No doubt there are many ways to eliminate unnecessary severe reactions. When these avoidable reactions have been excluded and the patient is given the largest doses conforming to safety, we believe the results will be better than using any standard universal dosage.

We realize that we cannot come to any definite conclusion as to therapeutic efficiency based on as few as five cases, yet it is a significant fact that these were the only severe reactions we were able to tabulate. None of these cases, at any time during their treatments, showed any marked nitritoid reaction except those having Jarisch-Herxheimer reactions, and the severe reactions came on within one to five days after the administration of arsphenamin. Two of these cases had definite hepatic symptoms, one had exfoliative dermatitis, and two can probably be classified as having quite severe Jarisch-Herxheimer reactions.

We will report in brief one case of each form of these reactions.

Case I. *Exfoliative Dermatitis.*—R. W., White, male, age 21, single man. Seen by us October, 1921. He had had the diseases of childhood, including articular rheumatism.

Examination.—Patient had had for two months a chancre on lower lip and an enlarged gland just beneath right lower jaw. He had mitral regurgitation, moderate amount of albumen in his urine and a kyphosis due to his rheumatic attack. Wassermann test 4+.

Treatment.—He received weekly injections, .4 gms. arsphenamin and one gr. soluble mercury, with only slight reactions until the fourth injection of arsphenamin, November 30, 1921. Four days after this injection, patient noticed an itching sensation all over body and legs. Next day he had an urticarial like rash over body and legs. Treatment discontinued.

Five days later I was called to see patient, and at this time he had large vesicular erup-

tion over body, face, scalp, feet and penis. His eyes were completely closed from the swelling of the surrounding tissues and his breath very foul.

His condition became critical; he could not move in bed on account of weakness; there was a continuous dripping discharge from the breaking of the vesicles; at times he suffered from anuria and constipation.

Later on his skin became very scaly all over his body and extremities and, each time olive oil was applied and warm sponge baths given, a large amount of desquamated skin came off and pinkish new skin would show underneath.

On January 8, 1922, patient had regained his strength and there were large spotted brownish discolorations all over his body. Wassermann negative.

April 14, 1922, Wassermann negative.

August 21, 1922, Wassermann negative.

September 15, 1922, Blood Wassermann and spinal fluid Wassermann negative.

Comment.—The patient's weakened condition and the possibility that there was a slight Herxheimer reaction before the last injection given to the patient, may have been the cause of his severe reaction.

Liver Reactions with Jaundice.—"Milian states that in 2,125 injections of arsphenamin, he has observed jaundice and liver symptoms 17 times. He found that jaundice usually does not appear until about two months after treatment, and that it usually developed in those who had received insufficient treatment."[5]

Case II.—Mrs. S., age 49, white. Had diseases of childhood, malaria and dyspepsia. Husband died of rheumatism and syphilis ten years previous. On admission she had had rheumatism and occipital headache six years. Wassermann 4+.

Patient took seven injections arsphenamin and six injections mercury with no reaction. Three days after the eighth injection of arsphenamin, she had an urticarial like eruption over body and at the same time her face and feet swelled up very much and became purplish colored. These symptoms lasted about two weeks. Her urine was negative for albumen, but filled with bile. Her liver was very much enlarged.

As soon as eruption left, her eyes and skin were markedly jaundiced. Two weeks later patient complained of pain in her back. At this time no jaundice but slight palpitation of the heart.

Patient recovered in about two months after her severe reaction and felt well. She has had a continuous negative Wassermann test for six months.

This woman had her menopanse just about the time of her severe reaction. She menstruated regularly one year before taking treatment, twice the month she had severe reaction, and has not menstruated since.

Jarisch-Herxheimer Reaction.—"This reaction consists in the exaggeration of the pathologic and hence the clinical processes, following the administration of antisyphilitic medication. Clinically, it is noted that the lesions become of a brighter color, and that some swelling usually takes place."[6]

Case III.—Miss M., in 1919, started taking treatment for syphilis. At that time her Wassermann test was 2+. After her first course of treatment, her Wassermann was 4+. This woman, after having taken treatment for over a year, and after having had a continuous 4+ Wasserman test, was given two courses of treatment, consisting of 8 injections of neoarsphenamin and 15 injections of soluble mercury each, after which her Wassermann was 4+. During the third course of treatment given her by us, which consisted of administration of arsphenamin and mercury, she developed a rash over her body, and both knees became swollen and red. She had a negative Wassermann test a few weeks later. Unfortunately, we have been unable to see this woman again to get any more tests on her, but we understand she is still living in this city.

Significance of Conditions Associated With Syphilis.

It is well to bear in mind that though a patient may have well defined clinical and serological syphilis, yet the very condition for which he seeks relief is some concomitant unassociated lesion. There is a tendency of late years, since the Wassermann test has become so popular, to relegate a case for syphilitic treatment, as soon as this test is found to be positive, not always taking into consideration that this may be only one of the diseases with which the patient is afflicted.

One case that proves this significance came to us recently. A negro had been treated locally for an ulceration on his penis which, when seen by us, looked as if a penile amputation would be necessary in order to save

other structures. He had typical skin lesions of syphilis, and the bony septum of the nose was partially destroyed.

Three injections of arsphenamin cleared away the lesions on his skin, but the ulceration on his penis continued to spread, two other similar ulcerations appearing on the inner side of left testicle, and inner side of left leg respectively.

We tried intravenous injections of tartar emetic for granuloma inguinale, and the patient's genital lesions improved after the first dose, showing continuous betterment until cured. The patient is now under syphilitic treatment.

This case is cited to illustrate the clinical significance in the treatment of syphilis associated with some other disease, and it is always well to bear in mind that, although a patient may have syphilis, he may have other contemporaneous diseases as well, along with other symptoms due to these diseases.

Conclusions.

1. In our series of cases, arsphenamin and neo-arsphenamin are both useful in the treatment of syphilis, but the former is more potent and should be used whenever practicable.

2. A great many useless, unnecessary reactions from the administration of the drugs can be eliminated, thereby increasing its usefulness. No attempt has been made to incorporate in this paper every method that we have tried out to avoid these reactions.

3. There are very often many diseases and conditions associated with syphilis that we must not expect to respond to luetic treatment.

4. That, although in our series the severe reactions were followed by negative tests and eventually clinical improvement, we hope some day to be able to increase the tolerance of the drug to the desirous therapeutic effects without these distressing phenomena.

Arsphenamin Reactions.

Men

	No reaction	Malaise	Chills & Fever	Diarrhea	Vomiting	Nitritoid	Severe
75 cc. .6 Gm....	194	30	12	3	12	2	1
75 cc. .4 Gm....	115	8	10	5	12	0	1
100 cc. .45 Gm....	10	0	0	0	0	1	0
50 cc. .4 Gm....	8	0	0	0	0	1	0
100 cc. .6 Gm....	31	4	0	4	6	3	0
	358	42	22	12	30	7	2

Women

	No reaction	Malaise	Chills & Fever	Diarrhea	Vomiting	Nitritoid	Severe
75 cc. .4 Gm....	88	25	1	4	30	4	3
100 cc. .45 Gm....	28	0	0	1	6	1	0
50 cc. .4 Gm....	3	0	0	0	3	1	0
100 cc. .4 Gm....	26	0	1	0	1	0	0
	145	25	2	5	40	6	3

Neo-Arsphenamin Reactions.

Men

	No reaction	Malaise	Chills & Fever	Diarrhea	Vomiting	Nitritoid	Severe
10 cc. .6 Gm....	114	8	1	1	11	4	0
10 cc. .9 Gm....	12	1	0	2	3	0	0
10 cc. .7 Gm....	10	2	0	0	1	0	0
	136	11	1	3	15	4	0

Women

	No reaction	Malaise	Chills & Fever	Diarrhea	Vomiting	Nitritoid	Severe
10 cc. .6 Gm....	143	41	7	2	20	10	0
Total.....	783	119	32	22	105	27	5

References.

1. Bureau of the Public Health Service, Bureau Circular 356. Subject: "Preference to be Given Arsphenamin Over Neo-Arsphenamin." Hugh S Cumming, Surg. Gen. June 13, 1922.
2. A. M. A., Vol. 79, No. 6, page 421. "The Limitation of Intravenous Medication." Carl Voegtlin, Ph. D.
3. "Modification of Gravity Method of Administering Arsphenamin." J. A. M. A. August 6, 1921. Vol. 77, page 464.
4. Zimmerman, E. L. "Neurorecurrence Following Treatment with Arsphenamin." Arch. Derm. & Syph. Vol. 5, No. 6.
5. Milian; Bull. Soc. Franc. de Dermat et de Syph. 1914. XXV., 365.
6. "Syphilis." Henry H. Hazen, A. B., M. D.

Dickson Building.

LUMBAR PUNCTURE IN THE ROUTINE TREATMENT OF SYPHILIS.*

By WARREN T. VAUGHAN, M. D., Richmond, Va.

Many cases of syphilis are treated routinely with intravenous arsphenamine, mercury and iodides, with no investigation whatsoever of the reaction of the spinal fluid. In the majority of instances the duration of treatment is controlled by the intensity of the blood Wassermann reaction, no attention being paid to the possible persistence of a positive spinal fluid after the blood has become negative. In a large proportion of late neurologic syphilides with positive spinal fluids, the blood Wassermann is negative. I wish to present a few cases in which these facts are well established and to suggest remedial measures.

Mr. M., when first seen, complained of "an unbalanced feeling." The patient was a mid-

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31—November 3, 1922.

dle-aged man with an alcoholic history and a story of having had gonorrhoea several times and a chancre twenty-five years previously. He was married, had four children, none of whom apparently showed signs of congenital lues. His wife had had no miscarriages. He had received only local treatment for his chancre, and had been told that secondary lesions did not develop. Two years before the first examination he had developed some unsteadiness in walking, with slight impairment of vision and urinary incontinency. He then received two intravenous doses of salvarsan and potassium iodide. Within six months the blood Wassermann had become negative, and treatment had been discontinued, but the symptoms progressed. Examination at the first visit showed typical Argyll-Robertson pupils, absent knee-jerks and Achilles jerks, a positive Romberg, and impaired co-ordination in the lower extremities. The liver was enlarged. Systolic blood pressure was 160. Lumbar puncture was performed, and the spinal fluid showed 20 cells per cubic mm., and a positive globulin reaction. The blood Wassermann was negative. The spinal fluid Wassermann was four-plus, with .5 cc. of fluid.

Here is a case with insufficient intravenous treatment, in which no attention was paid to the central nervous system until after irreparable damage had occurred, when the spinal fluid was found to be still strongly positive.

Mr. W., when first seen complained of inability to walk well. Fourteen years previously he had developed a genital chancre which was followed in due time by a secondary rash. He took mercury inunctions and medicine internally for a period of two years. Four or five years later he complained of feeling "lightheaded," and later noticed that he could not walk straight. Two or three years after this he began experiencing sharp shooting pains in his hands and his feet, with occasional twitching of the muscles of the extremities. During the two years previous to the first visit he had had rather indefinite abdominal pains, intermittent in character, never severe, and not connected with his meals. On physical examination the pupils were found to be Argyll-Robertson in type, and the tendon reflexes were all absent. There was marked ataxia of the upper and lower extremities, and the patient was scarcely able to stand without support. The blood pressure was slightly elevated, the systolic being 170. A diagnosis was made of tabes dorsalis and hypertension. The blood Wassermann reaction was negative, while the spinal fluid Wassermann was four-plus with .2 cc. of fluid. The cell count was 76, all lymphocytes, and the globulin was increased, four-plus.

Mr. L., aged 49, first complained of dizziness, weakness in the legs, and inability to walk straight. From the examination, a diagnosis was made of syphilis of the central nervous system, chronic nephritis, and hypertension. He was treated over a period of several months. Throughout the period of treatment the blood Wassermann was constantly negative. The original spinal fluid Wassermann was positive, and the cell count, 16. Under treatment the cell count fell to 2 per cubic mm., and the spinal fluid Wassermann improved so that it eventually became two-plus and, to obtain this reaction, 2 cc. of spinal fluid were necessary. There was considerable subjective improvement.

Mr. O., aged 62, when first seen, complained of pains in the legs and arms of twenty years' duration, and so severe as to require the use of morphine. He had had a gonorrhoeal infection when young, and a chancre with satellite bubo but no secondary manifestations twenty-five years previously. He had had various therapeutic measures applied for his symptoms, among which had been the extraction of all of his teeth. He had received one course of mercury. His nervous symptoms had started with headache, but later the pains had passed into the extremities and disappeared from the head. The attacks consisted of typical crises coming on three or four times a year at first, but steadily increasing in frequency, and relieved only by the use of morphine. He complained of pains in the legs, griping pains in the abdomen, marked constipation, and formication and ataxia at night. Again the pupils were Argyll-Robertson in character, unequal and irregular. The tendon reflexes were absent, there was a positive Romberg, some roughening over both tibiae, and a tendency to a positive Babinski in the right foot. In this foot there was a loss of pain sense, with preservation of tactile, muscle and temperature senses. The patient also had a typical tabetic bladder. A diagnosis was made of tabes dorsalis, secondary anemia, chronic cystitis and chronic morphinism. The blood Wassermann was negative. The spinal fluid Wassermann was four-

plus with 2 cc. The cell count was 0, and the globulin test negative.

The following cases differ from those just described, in that the blood Wassermann was negative, in spite of the fact that the patients had never received antiluetic treatment.

Miss F., aged 29, first complained of nervousness and of weakness of the left leg. Venereal disease was denied both by name and symptom. Eight months previous to the first examination her left leg below the knee began to feel weak, and she had experienced some difficulty in walking, particularly in climbing. The symptoms gradually progressed, and there had developed a sensation of numbness in the same extremity. At the same time the right upper eyelid had begun to droop and to swell. She had also noticed that the right pupil was larger than the left. She consulted a physician, who put some drops in the right eye, and the pupil became temporarily smaller. She complained of some blurring of the vision, and occasional diplopia. Physical examination showed a perforated nasal septum, unequal pupils which did not react to light but did react well to accommodation, absent knee jerks and ankle jerks, and a marked swaying in Romberg's position, with considerable difficulty in turning about quickly. A diagnosis was made of tabes dorsalis. The patient had never had antiluetic treatment. The blood Wassermann was negative. The spinal fluid Wassermann was four-plus with 1 c.c.; cell count 14, all mononuclears. Spinal fluid globulin was one-plus.

Mr. G., aged 42, first complained of pains in his chest. His family history and past history were both negative. Six months before admission he had had a double hernia operation. Four months before admission he had first experienced a poorly described pain in the skin over the chest. This persisted constantly, but was never very severe. On examination he was slightly irrational. The pupils were sluggish, irregular and unequal. The tendon reflexes were all exaggerated except the Achilles reflexes, which were present but obtained with some difficulty. A diagnosis was made of dementia paralytica. The patient denied both gonorrhoea and syphilis, and had, so far as he knew, never received anti-syphilitic treatment. The blood Wassermann was negative, but the spinal fluid reaction was four-plus. The spinal fluid cell count was 20, all lymphocytes, and the globulin was two-plus.

Summarizing the cases so far described, we may emphasize that a negative blood Wassermann does not rule out syphilis of the central nervous system, neither in those cases which have undergone routine antisyphilitic treatment nor in some cases in which there has been no previous treatment whatsoever. Where symptoms or signs point to a possible central nervous involvement, a diagnostic lumbar puncture should be performed, even though the blood reaction be negative and even though there is a negative past history both for infection and for treatment.

The converse is likewise true, as we shall see in the following cases. Individuals with positive blood Wassermanns, having no central nervous symptoms or signs, may yet have positive spinal fluid Wassermanns. In these cases particularly, the fact should be recognized early, and the condition of the spinal fluid should be followed as a guide, together with the condition of the blood Wassermann and the clinical findings.

Mrs. K., aged 31, was admitted with a traumatic ulcer on the right leg. The ulcer had persisted for a year, nearly healing, only to break down again. She had no nervous symptoms and no neurologic symptoms. The pupils reacted both to light and distance, although the reaction to light was poorly sustained, there being a moderate hippus. The patient was somewhat euphoric, although not pathologically so, and there was no memory defect and no defect of judgment. The blood Wassermann was four-plus. The spinal fluid was four-plus with .2 cc., cell count 18 per cubic mm., all mononuclears, and the globulin two-plus.

Mr. B., aged 60, entered complaining of pains in the abdomen and back. He knew that ten years previously he had contracted syphilis, and had developed the usual secondary lesions. Treatment had consisted of mercury pills by mouth three times a day over a period of three years. After this for several years he had taken the same pills for three or four months each spring. He had remained well until three months before the first visit, when he had developed attacks of epigastric pain, coming on immediately after breakfast, and relieved by the taking of food. They also occurred at night after he had retired. The blood Wassermann had been positive five years previously, and was again positive when the patient was first examined. Detailed neuro-

logic examination was entirely negative. The patient felt that his memory had become impaired during recent years. The spinal fluid Wassermann was four-plus with .3 cc., cell count 30 per cubic mm., 97% mononuclears and 3% polynuclears, and the globulin reaction was three-plus. A diagnosis was made of syphilis, syphilis of the central nervous system and dementia paralytica.

Mr. G., aged 65, has had recurrent attacks of rheumatism since the age of 35, with some indefinite pains in the stomach usually worst during wet weather. Fourteen or fifteen years previously he had had a nervous breakdown of indefinite description, but in which he had been extremely ill. There had been a slow convalescence therefrom. On admission, he was suffering from palpitation and dyspnea on exertion. The only neurologic symptom consisted of numbness and "pins and needles" sensation in the right hand. There were no objective neurologic findings whatsoever. The blood Wassermann was four-plus, and the spinal fluid reaction four-plus with .3 cc.; globulin two-plus. Cell count was not made because of the presence of blood in the spinal fluid.

Mr. B., aged 51, complained of frequent micturition, with a throbbing in his head at night. Eleven months previous to admission he had contracted a chancre, which was followed by secondary manifestations, and was treated by two intravenous injections of salvarsan five weeks apart. This had relieved all of his symptoms except the sensation in his head and the frequent micturition. Physical examination was essentially negative except for right middle ear deafness and rather hyperactive reflexes. The deafness was found to be due to a large accumulation of wax in the ear. Bone conduction was normal. The blood Wassermann was four-plus, spinal fluid Wassermann was four-plus with .4 cc., cell count 11, globulin one-plus.

These patients showed positive spinal fluid findings in spite of absent or minimal signs of cerebrospinal involvement. Conversely, again, it occasionally happens that undoubted syphilitic nervous lesions may occur in the presence of a negative spinal fluid. The spinal fluid reaction is determined chiefly by the extent of involvement of the meninges. With purely cortical or cerebral vascular invasion in the absence of meningeal irritation the spinal fluid may be expected to be negative. The following case, with signs pointing to cerebral vascular damage, showed a positive blood Wassermann and a negative spinal fluid Wassermann, but positive cytologic findings in the fluid.

Mr. D., aged 31, complained of numbness of the left side, of four years' duration. At the onset he had evidently had a cerebral vascular lesion, which had started with numbness of the left foot, quickly spreading over the entire left side, followed by unconsciousness and then delirium, from which he slowly recovered. Three years later he had a second similar attack. On physical examination the tendon reflexes of the left side were all exaggerated, and cutaneous sensation over the entire left side was diminished. There was a positive Romberg, and marked ataxia over the left arm and leg. The surface temperature of the left hand seemed somewhat lower than that of the right. There was no muscular impairment. The findings were otherwise negative. This patient showed a four-plus blood Wassermann, and negative spinal fluid Wassermann with 2 cc. on two examinations. The spinal fluid cell count was 40, all mononuclears, and the globulin two-plus.

Examination of the spinal fluid for Wassermann reaction alone is not sufficient. Both the cell count and globulin may be increased, with a negative Wassermann. As Fordyce, Wile and Stokes have all pointed out, in early syphilitic lesions, particularly the early secondary stage, the cell count is customarily increased before the spinal fluid Wassermann becomes positive. Thus, Mr. M., with a chancre of the lip and an early secondary eruption, a four-plus reaction of the blood and a negative reaction of the spinal fluid, showed an increased globulin content and a cell count of 35. There were no neurologic signs or symptoms. Here is a case in which treatment will not be completed until after we have convinced ourselves that the spinal fluid findings as well as the blood findings are negative. It is this type that, untreated, is prone to develop the late neurologic accidents.

Of course, as far as the patient is concerned, it would be of no advantage to study the spinal fluid if the treatment were not to be guided by the findings. Thus, there are those who claim that intraspinal therapy is unnecessary; that the results from intravenous treatment alone are entirely satisfactory. But, if this were true, the only method of

proving it would be by examination of the spinal fluid for evidence of complete cure. A second group of syphilographers contends that in cerebrospinal involvement intravenous therapy should be supplemented by spinal fluid drainage—while yet another group holds that for proper treatment salvarsanized serum should be given intraspinally in conjunction with intravenous treatment. Dercum is among the leading proponents of spinal drainage, while Fordyce, who has had an extraordinary experience in the treatment of cerebrospinal syphilis, is firmly convinced of the superiority of intraspinal therapy.

Time does not permit a summary of the evidence for and against the three methods of treatment, but the weight of evidence indicates that intraspinal administration of salvarsanized serum has a distinct field and should be employed in all cases in which intravenous treatment has not satisfactorily cleared up the central condition. For satisfactory results intraspinal treatment must be begun early. Tabes and taboparesis when usually recognized are past cure and usually past improvement. The future hope of therapeutic advancement in this field consists in early recognition of neural involvement and intensive treatment before the appearance of localizing signs or symptoms. The routine which I have followed consists in the giving of an initial course of intravenous therapy, followed by re-examination of the spinal fluid. If improvement is noted the method of treatment is not changed. If no improvement in the spinal fluid findings has occurred intravenous treatment is reinforced by intraspinal therapy, using the Swift-Ellis technique. In cases of early secondary syphilis it is safer to give three or four intravenous treatments before performing the initial lumbar puncture, so as to lessen the hazard of meningeal invasion subsequent to the puncture itself.

Conclusions.

A negative blood Wassermann does not rule out central nervous system syphilis, even in those cases who have had no anti-luetic treatment. In case of doubt, a diagnostic lumbar puncture will give valuable information. The intrathecal pressure should be roughly estimated, cell count and globulin content should be recorded, and Wassermann reaction should be determined. Recently we have also been employing the colloidal gold reaction as a control for the Wassermann. It is important to use amounts of fluid up to 2 cc., in the Wassermann test, so that a weak positive will not be overlooked.

No case of syphilis can be said to be successfully protected against late neurosyphilis until the spinal fluid has been studied and found to be normal.

Early treatment of neurosyphilitic lesions, before the development of localizing signs, offers the only promise, at present, of satisfactory therapy. Spinal fluid examination affords the only means of recognizing this early involvement.

Every syphilitic should have at least one lumbar puncture performed, early in the course of his disease.

404 *Professional Building.*

A PLEA FOR A MORE COMPREHENSIVE VIEW OF THE CORRELATIONS IN THE STUDY OF MEDICINE.*

By J. H. HIDEN, M. D., Pungoteague, Va.

The subject is so broad and many-sided, so mingled and intermingled with every department of medical science, that it may be designated as almost as broad as the study of medicine itself. The physician of only average ability, with a very limited degree of culture, merely grasps a bird's-eye view of the subject, while the accomplished, matured physician, with his analytical powers well trained in medical thought, with his intellect stimulated with the rich accumulations of knowledge, stands, at times, appalled, as he sees far beyond his ability to advance. He soon realizes that it is not a mere theoretical view of an almost unlimited degree of learning for which we are struggling; but a practical, intimate knowledge of the various departments of the science that can be skilfully and effectually used for the relief of human sufferings and for the cure of disease. This decision is not only individually, but is generally correct, provided such a decision is not reached by the physician until he has accumulated sufficient general knowledge to act as a safe and scientific balance in his chosen field of work, otherwise, this view becomes questionable, oftentimes embarrassing and, in some cases, even dangerous to the welfare of the public.

The correlations of medicine may be divided into several headings: (1) "Those having re-

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31—November 3, 1922.

ciprocal or mutual relations; (2) Those manifesting a relation of parallelism; (3) Those showing interdependence of structure, organs, functions or natural forces." In this paper, however, I shall not follow any definite order, for my object is not to give any logical, symmetrical discussion of the subject, but only to throw out some suggestions for the stimulation of further thought. The classification itself is purely artificial and is by no means well-defined; for the correlations of medical study are so numerous and, as I have before intimated, so intimately associated in this great fabric of medical science, that they may be often seen and studied under almost any classification you may suggest.

Within the last decade an increased interest in the reciprocal or mutual relationship of the vital structures, organs and functions of the human body has been awakened by the brilliant work of Dr. George Crile. This is especially true in the field of the endocrine system. And though his materialistic view of these correlative forces, expressed in his so-called "Mechanistic activation of the kinetic drive," has introduced more complex problems than he has ever solved, his work still stands out as a remarkable stimulation to modern medical thought. In addition to Dr. Crile's work, with the great volumes of literature that have appeared in our standard medical journals within the last two or three years, where is the physician, who does any thinking for himself, who has not been deeply impressed with the potent properties of the ductless glands? And where is the physician who does not feel the need of a more intimate knowledge of these organs, not only in their relation toward each other, but also in their relation to the complex cardio-vascular system, the phenomena of the nervous system, and indeed, the entire nutritional processes of our whole anatomical structure?

Yes, this awakening has come, and it is a daily observation in medical circles that a deficiency of study, and consequently, a lack of practical insight along these lines is often responsible for some of our most humiliating failures in the diagnosis and treatment of a certain class of our patients. For instance, we read and hear volumes of discussions of the hyper- and the hypo-thyroidism, and theoretically we are fairly well informed upon what we have read; but for all practical purposes oftentimes the reader has really taken in only two pictures of these disorders, namely, exophthalmic goitre and myxedema. All the intermediate disorders of thyroid toxicity or deficiency are only hazy, complex problems for some of the specialists or group practitioners. While this state of professional deficiency exists among so many of our general practitioners, many of these poor sufferers pass from one physician to another without finding relief and, in their desperation, often seek aid from the osteopath or some other quack. More often, however, they are sent to some hospital surgeon in whose hands they finally undergo an exploratory laparotomy.

Now, this is no imaginary picture. It has been a common occurrence all over the country. I have at present three cases in my own practice—each giving this history—all undergoing exploratory laparotomies to no appreciable advantage. They were all finally diagnosed as sufferers of thyroid deficiency. I may also add, they were all rapidly restored to health by treatment with thyroid extract.

As these cases represent striking illustrations of the lack of practical clinical insight into the intermediate state of thyroid deficiency, let us examine their history a little more closely. One of these cases had been repeatedly diagnosed as hysteria, one as neurasthenia, and the last as a sort of neurotic phenomenon, better suited for the diagnosis of the Almighty Himself. A review of the history and symptoms of these cases calls for no justification of these repeated diagnostic and therapeutic failures. They were all cases of obesity with more or less abdominal and tympanitic distention, with, at times, simple pelvic congestions with disturbed menstrual disorders of the menorrhagic type. They were all patients with weak hearts, slow and irregular pulse and low blood pressure. Moreover, these patients were subject to varied and multiform attacks of neuralgia, digestive disturbances, neurotic irritations and evidences of lowered metabolism. They also gave a more or less swollen appearance in their faces, and finally, suggestions of arrested mental development. It certainly seems here that an intimate knowledge of the correlations of medical science ought to have aroused a strong suspicion of thyroid deficiency in these poor sufferers, and yet they suffered for years before the dominant, etiological factor in their pitiful conditions was discovered. It may be asked: who was responsible for all this suffering?

Again, a closer and a more comprehensive study of the correlative relations of the structures, organs and functions of the human body is becoming more essential each day to meet the requirements in the social changes of modern life. Indeed, under our political, social, economic and domestic conditions, we find a frequent perversion of almost all the secretory structures of our entire organism. And, at times, many of these structures or organs may be involved in any given case. As a result of these conditions, the number and variety of neurotic disturbances occurring annually in almost any well populated community are simply appalling, requiring the most discriminating sagacity in ferreting out their respective etiology and in making correct classifications. Moreover, this work must be often done by clinical observations alone.

Indeed, in many cases the laboratory gives little or no assistance, and often what is given is only of a negative character. Under such circumstances the physician who has developed keen clinical insight is the one who is in demand. On the other hand, the less observant physician who depends almost entirely upon laboratory assistance from the technician to form his conclusions in any given case is so often a pronounced failure. Please understand I am not depreciating laboratory work. We all recognize that in many cases this is indispensable, but it is too often used as a sort of substitute for professional alertness in clinical observations. And as this alertness in our clinical vision is allowed to become more or less dormant in our daily service, we are sure to deteriorate in this important line of our work. In other words, we are simply gaining in one direction and losing in another. Real progress demands a gain in both directions. If either department of medicine must be neglected by the practicing physician, let it not be the clinical; for deficiency here, in the long run, means failure.

With this brief digression from my last thought, dealing annually with the appalling number of neurotic patients, I do not hesitate to say that the great majority of our failures to give relief in such cases is due almost entirely to a deficiency, not in theoretical knowledge of medical literature, but in alertness or practical insight in our clinical observations. How often do we find the physician face to face with one of these neurotics say, for example, a mild case of manic depressive psychosis, with a cycle of symptoms—periods of mental stimulation and depression accompanied with other neurotic disturbances, polyglandular involvement, a low blood pressure and deficient metabolism! He is dreaming over volumes of medical lore, and is completely at sea. The neurotic disturbance is allowed to progress, and the patient is called a neurasthenic when a practical insight into the clinical conditions—a familiarity with the correlations of the organs and functions of the nervous and glandular systems would solve his problem and save his poor patient from the most distressing state of mental deterioration.

Again, leaving the field of nervous disorders and coming to the specialist, how often is the oculist, after using his impressive examinations and local treatments, not only embarrassed, but perplexed and even helpless in some given case, say, for example, a case of chronic choroiditis, because he cannot find the dominant factor in its etiology among the correlations of some constitutional disorder! Just here I may say that two very interesting cases of choroiditis with exactly this history came under my observation several years ago, and that they were both finally cured by a general practitioner simply by giving careful attention to the underlying factors of some constitutional disturbance.

Now, while the whole medical field of activities abounds with such illustrations, why should I make a plea for more careful and comprehensive study along this line? My answer is because this line of work appears less attractive, more laborious and more tedious than many other lines to the coming generation of physicians. Indeed, to make an able, skilful, clinical diagnostician, requires not only time and patience to acquire a broad scope of medical knowledge, but also the time and experience to assimilate it. Moreover, in this restless age when there is a fascination in exchanging the old, tried methods for almost anything that is new and glittering, when there is a growing tendency among many to avoid intellectual drudgery and to hurry through with their work, to shift responsibility upon others, and to seek an easy seat in the band wagon of the great parade of medical progress, it is well to bear in mind that the so-called commonplace observations of the trained clinician are still indispensable. In closing, I will also add that in the face of all our recent, wonderful scientific discoveries, the

profession at large still needs, above all other things of similar import, a more intimate and comprehensive knowledge of the correlative relations of the structures, functions and, in case of disease, pathological processes of the human body.

DISCUSSION.

DR. M. W. CRAFFORD, Lee Hall: I would like to ask Dr. Hiden what symptoms preceded the laparotomy which was performed in three cases of hypothyroidism. I have seen hypothyroidism with flaccid muscles, low blood pressure and various symptoms, but I have failed to ever see one have symptoms which would lead me to think of having a laparotomy done, and, judging from his paper, I suspect these were cases already having been done by some other surgeon. If so, possibly he could not state, but if he had taken these cases from a history of the laparotomy, I wonder if they were not done for some other cause than hypothyroidism.

DR. J. H. HIDEN, Pungoteague: I can answer in two of these cases. I do not know about the third case, because it had been operated on before I saw it; it was turned over to me after the operation, and I don't know positively what the symptoms were previous to operation. But I feel sure that the case was suffering with hypothyroidism at the time I saw it, and I was the ninth physician that saw the case professionally. Of course, I do not know what the surgeon had in mind when he performed the laparotomy.

The other two cases referred to were seen by me before they went to the hospital, and they gave the symptoms of thyroid deficiency, as I have described in my paper. In one of these cases the operating surgeon gave me as his reason for operating that the patient had been sent to him by her physician, and that she insisted upon an operation. I suppose he thought that medical efforts were practically exhausted without relief, and that, as the patient desired an operation, he was justified in making an exploratory incision.

The second case had been treated unsuccessfully for a long time and was finally sent to the hospital. The surgeon in charge of the case, unable to make a positive diagnosis, did an exploratory laparotomy, pronounced it a case of neurasthenia, and sent her home. He was a good surgeon, too, but I can't say that he did any wonderful work on that occasion.

PRENATAL CARE AND TREATMENT.*

By ROBERT P. KELLY, M. D., Lynchburg, Va.

This is a subject on which much has been written, but its importance justifies any emphasis it may be given. There has been much discussion of the causes of maternal and infant mortality in obstetrics, and many methods of obtaining better results and of improving present records have been suggested by various authorities. As an obstetrician, it has fallen to my lot, of course, to deliver many women who have previously been delivered by other physicians. From discussions with these patients and from observation, I have reached the conclusion that the most neglected stage of pregnancy or labor is the ante-natal period, and it is my opinion that herein lies the chief opportunity of reducing maternal and infant mortality.

To the accomplishment of this end three things are essential:

(1). We must educate the *physician* to a proper realization of the importance of prenatal care.

(2). We must educate the *pregnant woman* to see medical advice early.

(3). We must find some way by which we can reach the newly married women of the country with literature which will make them realize the importance of seeking this antenatal care in the early months of pregnancy.

As to the first of these points, I feel sure that practically all physicians are capable of doing what is required in ante-natal treatment. For them all that is necessary is a keen realization of the importance of their work, of the serious consequences arising from its neglect, and of the excellent results obtainable through its proper execution.

On account of our failure to apply properly our knowledge in this field, I believe we are responsible for a large percentage of the infant and maternal mortality and morbidity, half of which, as well as half of the gynecological operations, may be traced to complications or causes which could have been relieved or prevented by proper prenatal care and treatment combined with skillful attention during labor and delivery. Assuming that this is true, is it not time that we were doing something to correct the fault and to prevent this loss of so many young mothers and babies? It is sad to see anyone die, but what else can so deeply stir our sympathy as the death of a mother in her effort to produce a living child?

Let us make a few inquiries into our methods of treating these cases. How many of us are doing our complete duty; how many of us would be satisfied to have our own wives receive the same prenatal treatment as we are giving to the wives of other men; how many of us pay any especial attention to this stage of a confinement case; how many are satisfied with a single examination of the urine, or even fail altogether to examine it; how many take the blood pressure regularly, if at all; how many take any notice of diet, exercise,

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31—November 3, 1922.

environment, family history and personal history, not to mention numerous other points of equal importance; how many ever listen for the fetal heart before or during delivery; how many make a diagnosis of position and presentation before or after labor begins; how many make a complete physical examination of the patient, as to pelvic measurements and the like? All these details and others are essentials of proper prenatal care and treatment. Unless we do these things, or most of them, whether we are specializing in the city or doing general work in the country, we are not doing our duty to our patients, and we are, at best, little better than many midwives. There is not a general practitioner among us who is not capable of giving his patients all necessary prenatal care, and if he is not willing to do so, he should not assume the dual responsibility of a confinement case. By properly carrying out this treatment, he will not only fulfill the better his duties as a physician and save himself much embarrassment, but he will thereby save the lives of many mothers and babies, and have the satisfaction of knowing he has been true to his patients and to his profession.

If I may indulge in a personal reference, I should like to cite a bit of my experience in this field. Throughout my fifteen years of practice I have been deeply interested in obstetrics and have always watched these cases very carefully. As a result, I have never had in my own practice a case of convulsions, the only such cases coming to me being those referred, or seen in consultation. Of course, I have had cases of toxemia, but—doubtless by good fortune—I have always been able to do one of two things: To get the mother through pregnancy by appropriate treatment, or, failing in this, to deliver her prematurely without convulsions, probably thereby saving her life.

If one should ask me what I consider the most important stage of pregnancy or labor, my reply would be the prenatal period; and for my patients, as a rule, if I should advise them to take only one of the three—prenatal care, attention during labor and delivery, or thorough post-partum care—I would select prenatal care. Of course, I do not mean to minimize the importance of a proper delivery nor of first-class post-partum care, but I do believe that more can be done, in the majority of cases, toward saving the lives of mothers and babies, by efficient ante-natal care and treatment than by any other means. In fact, there will be less need for interference during labor and delivery, and the post-partum period will present fewer complications, if we give to these patients the prenatal treatment they should have.

I wish to outline briefly what I consider some of the most important points in this treatment:

(1). A careful general physical examination, including heart, teeth and tonsils.

(2). A careful special examination, including measurements of the pelvis, diagnosis of position and presentation, condition of soft parts, position of uterus, etc.

(3). Past history, including family history, miscarriages and their cause, gonorrhoea, syphilis, nephritis, childhood diseases, past labors, if any, etc.

(4). Wasserman test, *at least* in suspicious cases.

(5). Regular urine examinations. At first every three weeks, then every two weeks, or oftener the last month.

(6). Blood pressure readings regularly, as in the case of the urine.

(7). Diet when necessary. To this point we are inclined to pay too little attention.

(8). General health rules, exercise, fresh air, sleep, no worry, condition of bowels, home conditions, etc.

(9). Give patient a list of instructions. Tell her to notify her physician when any of the following symptoms appear: Severe headache, edema, visual disturbances, vomiting in excess, retention of urine, bleeding, however slight, unusual pains in the abdomen, or any symptoms she cannot readily explain.

(10). Limit sexual intercourse, total abstinence the last month, possibly also the first few months.

(11). Pay particular attention to breasts, deformed nipples, etc.

(12). Do not allow patient to go long beyond term. Make careful examinations to determine this. Many babies die from this cause.

(13). Advocate the establishment of prenatal clinics, where the poor may go for examination and advice. We have such a clinic in Lynchburg, and I have the honor of conducting it. The greatest difficulty we encounter, in a large percentage of cases, is to

induce these patients to consult us early in pregnancy. If they do not come to us until near the end of pregnancy, of course we cannot give them the treatment they need. This lack of self-interest on their part is apparently due largely to ignorance and partly to embarrassment, both of which could be overcome, if we had some way to reach them and make them understand the importance of seeking medical aid early in pregnancy.

The question presents itself, therefore, as to how we are to reach these patients in a proper ethical way with literature which will teach them to realize the importance of seeking early this prenatal care. After careful deliberation, I have deduced a plan which I should like to present to this Society for consideration. I hope it may win your approval and co-operation to such an extent that definite steps may be taken at this meeting or in the near future toward perfecting it and putting it into operation.

I would suggest the enactment of a law requiring that the name and address of every newly married couple in Virginia be forwarded promptly to the State Health Department by the official issuing the marriage license, and that properly prepared literature on the subject of pregnancy and prenatal treatment be forwarded by the Health Department to each couple within sixty days after marriage. I think it would be well also to include in such literature information on sex relations, the injurious effect of interference with normal sexual intercourse, its bearings on sterility, and many other things of more or less importance, of which, as a rule, nine-tenths of the newly married couples are completely ignorant until too late. Special attention should be called to the importance of consulting a physician as soon as pregnancy is fairly certain or even suspected. If such a plan as this could be developed in Virginia and throughout the country, it would not be long before we would have a well informed public. Our cases would come in earlier and, as a result, many lives would be saved.

As a brief summary of my opinions on this subject, I would say:

(1). We are not doing our duty to our patients, to our country or to ourselves, if we fail to give the expectant mothers every possible attention during pregnancy.

(2). There is scarcely a physician in the state who is not capable of making these simple investigations, which are so important, as there is no other way of learning the condition of the pregnant woman.

(3). By giving the proper prenatal care and treatment, we can reduce, practically to zero, the deaths from convulsion, which now claim many.

(4). Through our medical journals, textbooks and colleges, we can bring physicians to a realization of the importance of this work, and through the State Department of Health we can educate expectant mothers.

(5). When possible, a specialist should be called in consultation on every complicated prenatal condition and on every difficult or complicated labor case.

705 *Church Street.*

DISCUSSION.

DR. W. A. PLECKER, Richmond: This is an extremely interesting and instructive paper. This is a subject that has engaged my attention since I have been State Registrar. I took up that work as an old obstetrician, and one of the things that has grieved us most in our office is the large number of absolutely preventable deaths from childbirth that come in to us. If we take these statistics and study them, we can see the evidence of neglect all the way through.

We have been trying to work out a method in the office to overcome this, as far as it is in our power. In order to do this, we have had the legislature place under the supervision of the State Registrar all the midwives of the State, and we have tried to give them some instruction as to prenatal care, as far as it is possible to teach these ignorant creatures. We have forbidden these midwives to make vaginal examinations under any circumstances. If we can succeed in enforcing that regulation, we can save, each year, fifty to seventy-five deaths of mothers from septicaemia.

We have been trying to carry out a little educational work. We have a little booklet which we call "The New Family," which we send out to newly married women, which touches a little on this subject. We are treading on new ground and a delicate subject, and we are wondering how far we can go with this method. That has been so gratefully received by hundreds of the most intelligent women to whom we sent it, and so many inquired for further prenatal literature, that we have something more comprehensive just from the press. This purports to deal with the nutrition of the new family; we call it "Feeding the New Family," and it emphasizes particularly prenatal feeding of the mother, in the interest both of mother and child.

As to giving some of the advice mentioned in this paper, I would be rather afraid to risk it, because there is a little danger of offending some of these people when they have not asked for information. As to just what sort of prenatal talk we are trying to get over; of course, what we try to impress on these women is the fact that they must stay away from the midwives, and they must go to the best doctor they can, and then we urge upon them to place themselves under the care of a physician as soon as they discover that they are pregnant. We

suggest that regular examinations of urine be made, but we don't tell her her blood pressure should be taken and that those other things should be done, because she might have a doctor who does not do these things.

Dr. Kelly, closing: I fear that Dr. Plecker misunderstood my idea. I did not mean to convey the idea that the patient was to be given all the information contained in this paper. The thing I wish to emphasize is the importance of having the pregnant woman educated to the necessity of going to a physician early in pregnancy. I did not mean to include in these instructions to be sent these women anything that would tend to treat or induce these cases to treat themselves at home; far from it, but only such information as would persuade them to seek medical attention early.

CANCER, THE TRIBULUS TERRESTRIS OF DISEASES.*

By STEPHEN HARNSBERGER, M. D., Warrenton, Virginia.

A Nucleus of Truth. The West and Southwest grow a weed known as Tribulus Terrestris, or puncture vine, possibly a creptogamous plant, which, devoid of flowers, reproduces by minute one-celled spores. But this is of less importance than the truths we wish to impress by mentioning this accursed immigrant from Southern Europe. In its relation to the automobilist it is the very accurate counterpart of cancer to man. This vine or weed, if you prefer, lacks attraction, is innocent looking, and presents no appearance of danger, but when it is irritated by the impact of the wheels of the automobile driven against it, it punctures at once and forever destroys the life of the tire.

Delusive Security. So it is with the innocent looking skin blemishes which most people let pass as of no further concern than that they exist. Notably the little hard scale about the face, lips, ears, eyelids or bordering the muco-cutaneous surfaces or elsewhere; also the little painless knots, lumps, moles, warts, nevi, and the irregular nodules or any other blemishes perceptibly raised above the skin, especially that common incrustation called keratosis senilis. While ulcerative changes in these skin defects multiply rapidly after middle age, *malignancy does appear at much younger ages.* Do not let your eyes wake to weep.

Mindful and Faithful. In recent years I have removed warts and other defects from quite young children, one not over thirty months, advisedly, to prevent their fingering them. Plus the benefits of ablation, parents are relieved of the associated anxiety and I feel I have filled a just obligation.

I cannot estimate the large number of adults who have rid themselves of like skin faults through my advice; and without exception they were made happier because their minds were put at rest.

Consider the End. If these local trophic imperfections are removed early, the person is absolutely barred against future danger from that source. If left to later life, especially until the lymph nodes are invaded, the limit of sure exemption has passed, the human tribulus terrestris puncture is as certain as death is *inevitable.*

"They would none of my counsel . . . therefore shall they eat of the fruit of their own way." —Prov. 1:30.

In any Case, A Case of Conscience. The majority of people are ignorant of the mischievous meaning of these skin faults, as well as of the comprehensive means of providing for health in general; and all are more or less careless and inclined to drift along the unwitting way that induces malignance and the lesser ailments. They should be made to know and to realize that they hold a sacred personal part in making and keeping health.

"Through dreary wastes we wandering go, and weep each others woe."

Dare to be Wise. Surely it is a good thing to live and a natural thing to die. Then why should people put off doing that which prolongs the thing they desire and hastens the thing they want deferred,—it is a paradox that bars solution. But that's not our business as physicians, we are here for an ulterior and more merciful purpose, to lessen suffering and save lives. Hence, this is an appeal to interest, an argument to the judgment, that is, an argument deriving its force from the situation of the person intended, founded on his ignorance of facts.

Pertinent advice, "It is well to profit by the madness of others."

Not Merely for Ourselves. While this paper discloses an appeal to physicians to "get busy," it is designed to urge the people to take an intelligent view of the matter as it exists and to join us in our anxious effort to safe-guard them against that terrible, yet preventable tribulus terrestris burden of suffering and death. *It is for them and their children.* Shall it be tears of joy or wails of grief? *It is just as they make it.*

*Read by title at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

THE STRONGER REASON. The late world struggle for the freedom of the nations was unavoidable but the havoc assembling by the steady increase of cancer can and should be met and met promptly. To the United States Public Health Service is due the major part in skyrocketing the prevenient and persistent preventive knowledge that today is swiping the world of the waste of diseases. Its sustained intelligent aim and endeavor should have the force of the willing and grateful cooperation of the people whose welfare it has at heart. Don't be a moppet or a musang-coffee rat.

TEAM WORK COUNTS. Physicians are the duly authorized actors in the play of naturalizing prophylactic practices to the common good; all welfare workers are co-equal and essential factors in the canvass to establish habitual usage and insure lasting maximum results. Keep step with us! Fix in mind this statistical fact. In New York City last year the increase of the death rate from cancer was greater than from tuberculosis. Looking at it in this convincing way, how will it be with your children and grandchildren when they reach your age? If we fail in our duty now their suffering and deaths will be upon our heads.

NOT TO BE FORGOTTEN. It is a one-sided question but it is all on the side of conation; in other words of desire and will or volition. Get the idea? Save your children.

Read what Shakespeare tells you:

"This our life, exempt from public haunt,
Finds tongues in trees, books in running brooks,
Sermons in stones, and good in everything"—

except DELAY.

OBSTETRICS A NEGLECTED SCIENCE AND ART.*

By GEORGE THOMAS MYERS, M. D., Norfolk, Va.

I shall preface my remarks with a brief apology in stating that I read a paper by this title before the Norfolk Medical Society, November 24, 1913, but as we have had quite a number of innovations in obstetrics within the past ten years, and all innovations are not progress, I am of the opinion the title is apropos at this time.

Obstetrics is a scientific art and mechanical skill that should be given to woman during pregnancy, at the confinement, and through the puerperium. The scientific art can be learned only from a correct understanding of the obstetrical pelvis, the female organs of reproduction and the female generative organs, the physiology and pathology of normal and abnormal diseases in the female. If normal conditions are understood, abnormal ones will be recognized and appreciated in pregnancy, at the confinement and through the post-partum period. The mechanical skill can only be learned at the bedside and then only by painstaking attention to every detail in eliciting the presentation, position, location of the foetal heart sounds, a correct appreciation of the diameters of the pelvis, and every other method in vogue that is used to make a correct diagnosis of the particular case; and close attention during the delivery. This can be accomplished in only one way, and that is by competent instruction from one who has had special training and practical experience in this science. To succeed in any science one has to master the elements; the foundation well laid, attainment of knowledge will surely follow. The obstetrical teaching in the past in our medical schools has been neglected; the article of Dr. J. W. Williams of Johns Hopkins University that was published in the *Journal A. M. A.*, in 1912 in reference to the qualifications of professors of obstetrics in our medical schools was astounding. I think this paper has proved beneficial and encouraged better teaching of obstetrics in our medical schools during the past decade. A few years ago men graduated from our universities and medical schools and were licensed by our state examining boards, allowed to practice obstetrics upon an innocent community, who had actually never seen a case of labor, much less assisting in one. The condition is bad at this time, and there is a large field for better clinical teaching of obstetrics; the science of obstetrics has been looked upon as a minor subject, and the child-bearing woman in general has reaped the benefits thereof.

The profession of today underestimates the importance of the subject, and countless infants are sacrificed or made cripples and mentally defective for life, the mother shares the fate of invalidism for life, purely from ignorance on the part of the attendant at this eventful time. This is speaking conscientiously and frankly; it is high time that the profession were awakening to this important branch of medicine.

Obstetrics of all the branches of medicine should be specialized. The obstetrician should

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31—November 3, 1922.

be a man well versed in gynaecology, pediatrics, therapeutics, physiology, pathology, and, above all, he should be sound in his judgment, conscientious in his work, and capable. He should be able to perform any abdominal operation, thereby being in a position to cope with any complication that may arise in this particular line of work; capable of performing cesarean section, abdominal section for ruptured uterus and ruptered ectopic pregnancy. These complications do occur and, in the event of such, the obstetrician should be master of the situation, thereby giving to his patient that skill and attention she should receive and demand from him. The general surgeon is not as conversant with the various obstetrical operations as the obstetrician should be. A skilled surgeon is not necessarily a competent obstetrician, due to the fact that obstetrical operations are far different from other surgical conditions; that is to state, such as the application of forceps, performing version, podalic or cephalic, manual dilatation of the cervix, and in exercising the proper judgment and skill in dealing with a case of placenta praevia; face presentations, occiput posterior, transverse presentations, and many other complications that the obstetrician has to meet with in this branch of medicine; requiring the utmost skill and judgment from a ripened experience in this particular surgical obstetrical technique. I have seen thoroughly competent surgeons who did not know how to apply forceps correctly, namely; making a pelvic application in all forceps operations, or performing version without doing considerable damage to the mother and the child. Therefore, the various obstetrical operations and complications should be dealt with by the obstetrician and not by the general surgeon.

The application of forceps is a dangerous procedure in the hands of the inexperienced. The correct application of forceps requires a good deal of skill, and in many instances is a more serious operation than an appendectomy. Every graduate of medicine, if the occasion arises in his obstetrical work to apply forceps, will attempt to do so without even having had practical experience, although he will send his appendicitis cases to the surgeon. This is due to the fact that the importance and danger of obstetrical operations has not been taught the general practitioner, and the laity have not been educated to expect any more skill from one physician than another in the science of obstetrics. If the case terminates either in the death of the child or its mother (and in many cases both are sacrificed), the practitioner is exonerated from any blame, as it was the will of Providence and not his ignorance.

The vast majority of gynaecological cases that are met with are due to mismanagement or avoidable accidents of the pregnant and parturient state. This large class of invalids who owe their condition to careless, incompetent and unclean obstetrics can be reduced, if not practically prevented: the remedy is to be found not in the preaching, but in the practice of skilful, clean and conservative obstetrics. The old adage is apropos here: "An ounce of prevention is worth a pound of cure." De Lee in his text-book asks the question: "Is labor in the woman of today a normal function?" I feel confident he answers the question satisfactorily to us all, namely: "I say it should be, but is not."

With all the attendant zeal of modern obstetrical asepsis and antisepsis within the past twenty-five years, the deaths from child-birth in the United States are appalling, twenty to twenty-three thousand women dying annually. The percentage of still-births is entirely too high. We have had campaigns inaugurated to fight against tuberculosis, cancer, malaria, typhoid-fever, pellagra, hookworm disease and many other ills that the human frame is heir to, but I have yet to hear of one inaugurated for the betterment of obstetrical practice. The science and art of obstetrics has dragged along for centuries, and it has not reached the elevated place it deserves in medicine. The day is not far distant when the profession, as well as the laity, will awaken to the importance of the subject and demand better obstetrical skill and attention. Of all the branches of medicine obstetrical work is the most arduous, nerve racking, and the least remunerative from a financial point of view. But as to the accomplishment of actual results of scientific work, and the relief of pain, it outshines the other branches of medicine. No where is the conscientious physician put more to the test than in a complicated labor, if he has the interest of his patient and her offspring at heart: and I say frankly that in no other branch of our noble calling can as much harm, suffering and actual sorrow be brought to those most vitally concerned, than in the hours of promised motherhood.

Pelvimetry by the general practitioner is tabooed as being fallacious, but it is of the

utmost importance to have correct measurements of the pelvis in all primigravida, and in every case that gives a history of preceding difficult labors. If pelvimetry is practiced, the various contractions of the pelvis, exostosis, tumors and ectopic pregnancy are discovered. This enables the obstetrician to treat the case scientifically, not waiting until the patient has advanced in labor, with much suffering, before the true condition is elicited, when possibly it is too late to give the patient the benefits of the induction of premature labor or cesarean section. It can readily be seen and appreciated that pelvimetry is of the utmost importance and benefit. Pelvimetry in relation to the foetal head has not been perfected, although it is of some importance. When pelvimetry is adopted as a routine by the profession, craniotomy will only be occasionally performed, as this operation is unscientific and barbaric and should be relegated to the past as history of obstetrics. When we have awakened to the importance of details of pre-natal care in our patients, this operation will only be performed on the dead child.

It would be preposterous to apply forceps in a delayed labor due to a narrow conjugate. The obstetrical forceps is one of the greatest inventions in the obstetrician's armamentarium, and the one mostly abused. The name of Chamberlen should have gone down to posterity as one of the greatest benefactors to womankind; if the greed of filthy lucre had not been predominant in his makeup, his name in obstetrics would have been immortalized as is that of our illustrious father of gynaecology, J. Marion Sims, is by the speculum. The indications and contra-indications for the interference of labor by forceps I will not discuss, but it is well to bear in mind their usage is to extract a living foetus from the pelvis without injury to itself or the maternal soft parts. My own rule to to apply forceps in the second stage of labor if there is no advance in the head after two hours of full dilatation, the pains becoming less frequent and lacking in expulsive power. As a routine, the application of floating forceps should be condemned, and internal podalic version or cesarean section elected as the operation indicated. As to the interruption of labor before the completion of the first stage, I am of the opinion there can be no fixed rule; the individual case and experience of the obstetrician will be the deciding factors as to what method to pursue. The innovation by Potter in performing internal podalic version in every normal labor that is progressing satisfactorily, is unscientific, and will never become a routine procedure. With this panacea for the amelioration of pain and shortening of the second stage of labor, Potter performed one cesarean section out of every eleven cases admitted to his clinic last year. I have seen his work and I am still of the opinion that where version is indicated, forceps are contra-indicated, and *vice-versa*. Bear in mind one important operative technique in all forceps operations; the uterus should be fully dilated, membranes ruptured, bladder and rectum empty, the vulva shaved, the blades applied in relation to the position of the foetal head, the patient on a table, and under complete anaesthesia. In some cases it is preferable to deliver with the blades in position; in other cases to remove the blades when you can control the head at the vaginal outlet.

Placenta previa should be dealt with early as delay is dangerous. The treatment will depend upon the period of gestation and the stage of labor. If dilatation is sufficient to admit the performance of internal podalic version in the lateral and marginal varieties, this is the operation of election; if there is not sufficient dilatation, rupture of the membranes, sterile gauze tampons, Champetier de Ribes, or Voorhees bags may be used. In the central variety with hospital facilities, cesarean section, either the classical or Krönig's operation, is the obstetrical course to pursue. Accouchement forcé as a treatment of placenta previa should be condemned.

In speaking briefly relative to the treatment of eclampsia, and severe toxemias, the exact etiological factors are still in debate, with one exception: that they are the result of an impregnated uterus. In consideration of this fact, I feel that the best obstetrical course to pursue in these complications is an early emptying of the uterus. The method adopted will depend upon the stage of gestation, stage of labor, and whether the case is a primipara or multipara. In a primipara, with an elongated rigid cervix, cesarean section is the operation of election. Stroganoff's method has not proved satisfactory to me.

Puerperal sepsis is a preventable disease and is too frequently encountered in this enlightened age of asepsis and antisepsis. If we do not forget the clarion note of Oliver Wendell Holmes, the magnificient work and ap-

peals of Semmelweiss, and if in all obstetrical manipulations, cleanliness is our rule and guide, this disease will rarely be encountered.

Another innovation we have had is twilight sleep. The original technique as promulgated by Krönig at Freiburg has justly died a natural death; it was "weighed in the balance, and found wanting."

The innovation of bagging all cases that are presumably overdue is not sound obstetrical judgment, as there are numerous factors to be taken into consideration before arriving at such a conclusion.

The use of pituitrin during the first and second stages of labor is an innovation that is dangerous: the physiological action of the drug will ultimately result in serious complications to the advocates of this method. During the past decade experimental research has thrown much light on the physiological and pathological problems to be met with after the use of pituitrin, leaving out of consideration any speculative hypothesis. I have endeavored, in the time allotted to each paper before this section, to give you the salient points in this science and art. In conclusion, always bear in mind that the very outcast of the streets should receive the best attention, judgment, and skill from the obstetrician, in the hours of promised motherhood, remembering this motto: "*Non nobis solum.*"

624 *Armistead Bridge Road.*

DISCUSSION.

DR. M. P. RUCKER, Richmond: Dr. Myers has given us a good deal to think about. His opinion that our medical schools and colleges do not educate the student thoroughly in obstetrics is correct. In Richmond, in 1920, there was one maternal death in every eighty-eight cases. Of course, this is exaggerated, because some are abortions, but it is sufficient to show that there is a tremendous mortality.

When you stop to think, you can very readily see the reason for this condition. The medical student is taught obstetrics on the banks of Shockoe Creek, instead of in an up-to-date hospital, and therefore he gets a poor idea of the technique with which he goes out of school.

It is a well known fact that you very seldom do better than the ideals with which you start out. You usually drop a little below those ideals. If you carry from school a below-standard technique, you are not very likely to rise above it.

We have to do one of two things. We have to educate the people that an M. D. degree does not mean a master obstetrician, or we have to provide means for our schools to give their students all the facilities of studying obstetrics that a modern hospital has. I do not see anything else to do. You have got to have a post-graduate course in obstetrics, or else improved facilities for teaching obstetrics properly in the regular course.

DR. J. BOLLING JONES, Petersburg: I greatly enjoyed Dr. Myer's paper. To my mind this is one of the biggest subjects that we have to think about today. Obstetrics pertains not so much to the mortality, but to the morbidity. I am sorry to say that the average doctor thinks everything is all right if the baby is born, without giving any regard to the poor woman's condition.

I think that no obstetrician can be absolutely competent unless he has a thorough knowledge of gynecology. I believe that if all medical students were thoroughly educated in obstetrics, and the patients could be taught to see the subject in the true sense, the question of the midwife would be settled. There is just one other point that I want to speak of, and that is that too many surgeons cut in any old place without any regard to the pelvimetry.

DR. G. B. BYRD, Norfolk: I want to emphasize one or two of the points that Dr. Myers made. The first is the examination of the woman during the pregnancy and before the labor. I think that these examinations should be made as early in the pregnancy as possible. As to the method of pelvimetry to be used, use all at hand.

After the baby is delivered and the placenta delivered, I carefully examine the patient for any involvements. A great many men tell me that they have done a great deal of obstetrics and have never had any lacerations. A great many of mine have to have sutures. Examination should always be made just as thoroughly after delivery as before. When the patient is shocked and you are unable to do anything at the time, you should have the patient report back to you at some later time for a thorough examination. In treating a patient I do not believe that you have given all of the service you could if you do not ask her to report back to you for examination after the baby is born and after she is up. I am sure that if the men who boast that they have never had any lacerations had had the patient report back after about eight or ten weeks, they would find some little involvement.

DR. A. W. GRAVES, Lacey Spring: Obstetrics should be a very easy matter when you have the facilities of a hospital with all modern technique, but when you get back in the rural section, where the patients call you in at the very last minute, what are you going to do? It is too late, without secondary operation, to do anything. The only thing I see to do is to educate the expectant mother and the anxious father. Most of the complications are due to too much neglect afterwards by the mother. Where you have a case in a rural district, most likely someone has advised her not to go for examination and incur unnecessary expense. After the trouble it is too late to accomplish much. The fetal mortality in our section is very small where you have seen the mother beforehand and several times afterwards. After they get up they do not want to see you, as they think you want to get the extra fees. They do not realize the importance of coming for a urinalysis. Some people will take the good advice of other people and come to consult an obstetrician, but on the other hand, others will not call on you until their confinement. I feel what should be done is for all physicians to notify the health authorities of the expectant mothers in their districts or localities and have them sent letters or literature which would be of benefit to all newly married couples or expectant mothers.

In regard to the after treatment, one important point is the treatment of umbilical hernia, "tongue tie." Some cases can be cured, if you get them early enough; if they are neglected six or seven years, they of course come under surgical procedure: e. g., umbilical hernia.

If a physician knows of any women in his community who are going to be confined, whether cases of his or not, that physician should notify the health

authorities, and at all times co-operate in that capacity and treat all correspondence as confidential. Be ready or willing to aid in the one great purpose which we are in honor bound to fulfill and to assist new born babies to health, which should be under modern conditions.

Again I find so many mothers who have been "badly treated" by some one at first delivery. Why should some of our profession be so negligent at the most important moment of a woman's life, for health and liberty should be pre-eminent and we should not accept such a case if we are going to neglect the most important part of treatment—lacerations. Patients should be properly prepared, and I find the lateral position in bed the most successful for the post-operable conditions, enabling discharges to drain over non-lacerated tissues, thereby causing certainly a better union of lacerated tissues, if you have any.

Dr. George T. Myers, Norfolk, (closing): This is a serious subject. Dr. Rucker is entirely right, in that students should be given special training in obstetrics, not only in Richmond, but everywhere. The men who attend Cornell and other big universities are required to attend so many labors before they are allowed to practice. As Dr. Rucker says, the science of obstetrics has been sadly neglected by the profession as a whole.

In reference to pelvimetry, of which Dr. Jones spoke: pelvimetry is not accomplished until you use both internal and external pelvimetry. Dr. Byrd, in reference to lacerations: The patients should always be urged to return after six or eight weeks after delivery so that you can look for lacerations and misplacements. Dr. Graves, in reference to country practice: It has been my experience, in going to the country, to find a lack of co-operation among the doctors. The country practitioners cannot get help from each other. Obstetrics can be done as well in the country as in the city, and hospital facilities are not absolutely necessary. If you have competent assistance, there is almost no danger in performing the various obstetrical operations, namely: forceps and version and, if absolutely necessary, the cesarean operation can be performed in the country districts.

LATENT MAXILLARY SINUSITIS.*

By J. WARREN WHITE, A. B., M. D., Norfolk, Va.

The anatomy of the maxillary sinus will be described briefly so as to show how easily an infection may be latent for years and produce no local symptoms.

The maxillary sinus is a pyramidal shaped cavity hollowed out of the superior maxillary bone. The floor may be on a level with the floor of the nasal cavity or it may be at a considerably lower level. The floor of the cavity is by no means smooth and regular, and quite frequently it is divided by bony septa into pockets. Frequently, roots of the bicuspid and molar teeth project into the cavity. The walls of the cavity vary considerably in thickness. The mucous membrane is continuous with that lining the nasal cavity and does not differ materially from it. The maxillary sinus communicates with the nasal cavity by a small opening in the middle meatus. Thus we can easily see the difficulty in drainage of an infected maxillary sinus and how easily an infection may become encapsulated in the cavity.

As to the percentage of maxillitis, from dental and nasal infections, there is a wide difference of opinion. It is, however, invariably secondary to either infections of the nasal cavity or infections around the roots of the bicuspid or molar teeth.

The mucous membrane of the cavity usually becomes very much thickened and polypoid-like. Frequently, well formed polypi are found projecting from the mucous membrane. With a thickened mucous membrane, pus can easily become encapsulated on account of the difficulty in drainage through the normal opening in the middle meatus. Chronic infections of the maxillary sinus are far more prevalent than the rhinologist and others have realized. Coffin, of New York, was among the first in this country to do any original work along this line and brought to the attention of the medical profession the frequency of sinusitis among children and the eye affections associated with it. At one time it was considered more a factor in dental than nasal diseases and then the surgery of this important sinus was turned over to the dentist. The drainage of the sinus through the alveolus was the operation for years, until its utter ineffectiveness was demonstrated and more rational methods were instituted.

Have we done our full duty in adenoid and tonsil cases until we have made a thorough nasal examination for the presence of infected sinuses? The reduction of mortality today is not in the treatment of diseases but in prevention. Thus, a searching investigation should be made for any other undermining factors in each case before removing the tonsils and adenoids. The presence of pus in the maxillary sinus with no tendency to recover spontaneously or by non-operative treatment is an indication for operative interference. In recent years the profession have come to realize the great number of systemic diseases resulting from latent infection. Several cases of tic douloureux have been reported as cured by clearing up a low grade maxillary sinusitis by operative treatment, with satisfactory drainage. The sinus disease, in this case, is more of a chronic infection of the mucous membrane than of a collection of free pus. The connection between maxillary disease and trifacial

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

neuralgia is certainly worthy of investigation. The question has arisen, is there any such thing as latent infection? The infection may be latent as to giving no local symptoms at its original source, but is there not going on a continual absorption into the general system from the original point of infection? We all realize the insidiousness of focal infections and the irreparable damage resulting therefrom before the patient even realizes the gravity of his condition. Preventive medicine is the medicine of the future and I am taking up latent maxillary sinusitis as one of the sources of focal infection that is frequently overlooked. As to the determination of the presence of pus in the maxillary sinus, it is very easy at times, but in some cases it is quite difficult. On nasal examination, if we find pus in the middle meatus, it is wiped away and the patient is told to place his head on his knees with the affected side down. This places the ostium in a dependent position and, if any pus appears in the middle meatus, we can feel reasonably sure it comes from the maxillary sinus. Transillumination is of great diagnostic value in some cases. Roentgenography has, however, supplanted all other methods of diagonsis as it is most convincing. A very slight infection will be shown by the X-rays on account of the obstructive character of pus and diseased mucosa. Exploratory puncture is frequently resorted to when all other methods of diagnosis are negative. A painstaking history is very important in these obscure cases in assisting us in a diagnosis.

I will report several interesting cases that have come under my observation. *First.*—Mrs. A., age 35, was referred to me by her dentist, with the following history. After the extraction of several teeth, he found the right maxillary sinus was infected. Drainage through the alveolus continued for several weeks prior to my seeing the patient. The personal history in this case showed that she had had severe headaches for two years, and had sought treatment at various times in an effort to be relieved of these headaches. The source of her trouble, however, was accidently discovered by her dentist. A Caldwell-Luc operation was done. The opening in the alveolus persisted for several months but eventually closed.

Second.—Miss C., age 38, came to me complaining of a cough and feared tuberculosis of the larynx. Physical and X-ray examination of her chest were negative. I found nothing on examination except a left bicuspid tooth that looked suspicious to me. She was referred to her dentist for further examination. The report came back that the X-ray picture showed an abscess at the root of the tooth and the root of the tooth extended into the maxillary sinus. The X-ray of the sinuses showed the left maxillary sinus infected. An intranasal opening was made and 15 cc. of pus was aspirated.

Third.—Mrs. G., age 55, came to me with a history of pain in the left side of her face and headaches for ten years. This dated from the time she had a severe spell of typhoid fever. Her eyes gave her a great deal of trouble and looking at a bright light would give here severe headaches. The X-ray plate showed a cloudiness of the left antrum. An intranasal opening was made and 10 cc. of pus was removed. The culture gave a pure growth of staphylococcus aureus. I will only report these cases in an effort to show their obscurity at times and also the importance of being on the lookout for this condition.

In closing, I wish to emphasize the following points which are most convincing. *First*, infections of the maxillary sinuses may be the etiological factor in arthritis and many other diseases; *second*, this infection may produce almost no local symptoms for many years; *third*, this infection works insidiously and irreparable damage may result therefrom; *fourth*, a search for foci of infection is incomplete until a thorough investigation of the sinuses has been made. The finding of other foci should be no excuse for not investigating the sinuses.

526 *Monroe Building.*

DISCUSSION.

DR. B. R. KENNON, Norfolk: I wish to thank Dr. White for reminding us again of something very important in the question of focal infection.

I am speaking of the other sinuses as well as the maxillary. There is no doubt that there are a great many infections of all the nasal sinuses that go along without any active symptoms to make a diagnosis for us, and it requires a more careful examination than has formerly been given these cases to give them the proper care. I have been in eye and throat work for twenty-three or twenty-four years and, when I first started, years ago, this sinus work was hardly begun. Patients would come to me and complain of having headaches and want their eyes examined. I would examine them thoroughly and, not finding anything the matter, would pass it up. I would let them go out of my office without examining the nose at all. We are not doing the best we know how by our patients if we let them go out of the office without examining the nose. If the case is then still obscure, we should take an X-ray. The X-ray will show where the trouble lies.

The X-ray is the best thing we have in these cases, because so often a transillumination does not show any trouble when the X-ray will do so.

When the X-ray is positive, you look in the nose and find pus, but you can have a diseased membrane where there is no pus.

The most important remark in Dr. White's paper was the examination of children for sinusitis, when they come complaining of respiratory trouble. Those children should be well examined. You have no idea of the number of children that have acute sinus infection. They are very, very important. I think that there has been entirely too much carelessness in the treatment of children.

If Dr. White can just impress on the members of the profession the importance of careful examination of children's noses, he will have done a great deal of good.

DR. A. A. BURKE, Norfolk: I think Dr. White's paper is very timely. It is a plea for thoroughness. In the past we have been prone to overlook these cases. If you have not made mistakes, it is because you have not found anything to make mistakes with. Unless we give a thorough and complete examination, we have failed in our duty. All cases should be gone into thoroughly—not only one case, but all cases. We should examine thoroughly not only the maxillary, but all of the sinuses.

I remember when we had the scare in New York about trachoma. They thought that there had been an enormous increase, but it had not increased, it was only because they were paying more attention to the examination.

Regarding the X-ray and the transillumination, of course the X-ray will give us forms of information that we cannot get through transillumination, but in my hands the transillumination has been of far more value than the X-ray. I believe it to be probably twenty-five per cent more accurate than the X-ray.

DR. H. L. MYERS, Norfolk: If we find the sinuses involved we know that we must do something. There are cases in which you look into the nose and cannot find anything amiss; even if you have looked well you are liable to say that there are no signs of infection. But that is not far enough. We know that we have something that is producing infection. Every single means of which we know should be used. Transillumination, inspection, radiographs, etc., should be used not only once but often.

Another important thing is getting the patient at the right time. Sometimes between my office and the office of the X-ray man the patient will blow his nose and all evidences of disease will be removed. If we do not have an X-ray several times, we are overlooking part of our duty.

What Dr. White has said of the maxillary is true of all the sinuses. A great number of the headaches that we cannot account for, can easily be accounted for if we look into the nose more often.

DR. J. W. WHITE, Norfolk (closing): The headmirror I think should be used more frequently. A nasal examination should always be made before removing adenoids and tonsils. In reply to Dr. Kennon as to why I confined my paper to latent infections of the maxillary sinus and did not refer to the other sinuses: The anatomy of the maxillary sinus, as I briefly described in my paper, shows how easily an infection may be latent for years and produce no local symptoms.

ART AS APPLIED TO ANATOMY.*

By JOHN WILKINS BRODNAX, M. D., Richmond, Va.
Associate Professor of Anatomy, Medical College of Virginia.

In considering the application of Art to Anatomy, it is my purpose to confine this paper to two aspects of the subject only; first, to the debt that anatomy owes to art, and, second, the benefit to be derived by artistic methods of observation in the study of anatomy.

To appreciate the debt that anatomy owes to art it is pertinent to give, in brief, the development of artistic illustration in its application to anatomical teaching, and the evidences of anatomical investigation by artists in the period when this science was in its infancy.

Anatomical knowledge of a certain character is as old as art itself, but this primitive knowledge was debased by imperfect observation and blind reverence for the many misleading traditions of the times. Even in these early days art was utilized, and anatomical illustration was employed wherever a semblance of anatomy was taught. Greece, India, and even China, in the remotest periods of their history, resorted to drawings, showing more or less imperfectly the relative positions of the heart, lungs and other large organs, for the purpose of demonstration. These crude efforts, however, need only to be mentioned, for it is not to the flimsy imitation of visceral anatomy that one must look for examples of art, but rather to these masterly drawings of a later date, that display in the highest degree two of the qualities upon which scientific progress depends, accurate observation, and a true record of the thing observed.

The history of art and that of anatomy are by no means contemporary. When art had reached a high stage of perfection, and the sculptor was producing those wonderful masterpieces, known to us as the antique, which are today the admiration of the world for their beauty of contour and faithfulness to nature, medicine was vague and obscure, and in the hands of charlatans, while anatomy, the basis of all medical science, was, for even a mind like that of Hippocrates, a collection of crude and imperfectly noted facts modified by the time-honored fictions of the day. During this dark era of medical knowledge, it was the artist alone who found light to study the anatomy of man. More than a century before the

*Read at the meeting of the Richmond Academy of Medicine and Surgery, May 8, 1923.

school of Alexandria had, under the Greek anatomists Herophilus and Erasistratus, inaugurated for the first time, the study of human anatomy by dissection of dead subjects, and it is said, even of living men, Phideas, the great sculptor of the age of Pericles (450 B. C.), and a contemporary of Hippocrates himself, had acquired such perfect knowledge of surface anatomy that his works appear to us now as the very acme of truth and beauty in the representation of the human form. His noble figures of the Theseus and of the Ilyssus of the Parthenon, the most familiar of his works, might be submitted to the scrutiny of the critical eye of the most finished anatomist or artist of this day, and I would venture to say that neither could discover an error in science or point out a line or contour which could be changed without detracting from the beauty and symmetry of the whole.

At the time these works of art were produced, the dissection of the human body had not yet been attempted; the respect in which the dead body was held was such that the physicians themselves, who should have been able to justify their motives for this study, had never as yet dissected a human body. Hippocrates had dissected animals, and had arrived at certain conclusions by the analogy that exists between the organs of lower animals and those of man. Galen himself dissected monkeys only, seeking to confine his examination to animals whose anatomical construction might be considered as most closely resembling that of man. Galen never possessed a human skeleton, for in a passage in his anatomical works he states the pleasure in studying at last some human bones that had been deposited in a marshy place by a river which had overflowed its banks. When we reflect that Phideas had not the advantages of the study of anatomy by the practice of dissection as did Michel Angelo, but acquired his knowledge of the subject solely through the constant observation of atheletes in action during games and military exercises his achievements appear all the more wonderful.

The establishment of the school of Alexandria, less than a century after the death of Phideas, should have done much to advance the knowledge of anatomy, as it is known that under Erasistratus and Herophilus the dissection of the dead body was practiced openly, but there was strangely little harvest from such a broad and fertile field, and the cultivation of original observation in human anatomy rapidly declined, until in the second century of our era, when Galen, strongly imbued with the spirit of research, by his investigations, was able to give to the world a series of writings which placed anatomy among the sciences, and furnished the profession of medicine with descriptions, so far as they went, not materially different from those contained in the text books of the present day.

Following the fall of the Roman Empire, we come to that darkest of all periods—the middle ages—when art was at its lowest ebb, when learning represented chiefly by Moslems and Arabs and a bigoted clergy was opposed alike to scientific investigation and artistic culture. During all this time anatomy remained at a standstill and little advancement was made in any of the departments of medicine. It was not until the thirteenth century that Frederick II., Emperor of Germany, and King of the Two Sicilies, revived the study of anatomy by dissection, by passing a law prohibiting the practice of medicine without the practitioners having first studied the anatomy of the human body. In spite of two papal excommunications hurled against him, dissections were from that time on regularly pursued in Italy. The first outcome of the new departure was the publication in 1316 of the first treatise on human anatomy, that of Mundini de Luze of Bologna, containing descriptions made from studies of the dead body.

Dissection was introduced into France at Montpelier in 1376, and it is to a French surgeon and artist, Henry de Mondeville who lived at the beginning of the fourteenth century, that credit belongs for having first made use in Europe of anatomical drawings as a means of instruction. The first really important application of art to medicine, however, belongs to a period no earlier than the fifteenth century, at which time artists rivalled physicians in the ardor with which they pursued their anatomical studies, and it may be said that all the painters and sculptors of that period gave the most careful attention to dissection, or at least studied demonstrations made upon the dead body, for all have left amongst their drawings anatomical studies that give evidence of that fact.

To this period belongs one of the most versatile geniuses in history, Leonardo da Vinci, painter, sculptor, scientist, poet, and musician. It was he who, first amongst the artists,

XUM

deemed it profitable to cultivate the friendship of representatives of the medical science. It is known that he became intimately associated with the physician, Marcantonio della Torre, of Ferrara and Padua, and that he made for him many drawings to illustrate an anatomical treatise, but the untimely death of Marcantonio in 1506 severed a connection which under more fortunate circumstances might have raised the anatomist to the eminence afterwards occupied by Vesalius. As it was, the great work remained unfinished, all that had been written was lost, and along with it disappeared the drawings of da Vinci. Only a few of the numerous anatomical studies made by this great artist still exist, but the skill

The Nike of Paionios (Circa 420 B. C.).

and anatomical exactness displayed in these bear witness of the care and attention he gave to the study of anatomy. Leonardo himself was the author of a "Treatise on Painting," in which he devotes numerous chapters to the description of the muscles of the body, the joints, and, in his words, the "Cords and small tendons which meet together when the muscles contract to produce action," etc. In this book, he makes allusion at different times to a "Treatise on Anatomy," which he intended to publish, and for which he had gathered together numerous notes.

The period of Leonardo and of the succeeding generation was a glorious one in the history of art, for while the great Tuscan was still in his prime, there appeared upon the horizon another many sided genius in the person of Michel Angelo Buonarroti, at once painter, sculptor, architect, engineer, and poet. The latter had just reached the zenith of his fame, when Leonardo, full of years and honors, died in the arms of the monarch whose graceful tribute to his genius did more to perpetuate the memory of King Francis I. than any other act of his long and stormy reign.

Michel Angelo, like his predecessor, was not long in seeing the advantages to be derived by associating art with anatomy. He attached himself to Realdo Colombo, one of the foremost anatomists of his day and for twelve years, first in Florence, then in Rome, he devoted himself to the study of anatomy. The results are apparent, possibly too plainly, in all his works. His statues of David, the Captives, and many others, give striking evidence of his profound knowledge of anatomy. Among the large number of drawings which Michel Angelo left to posterity are many beautiful illustrations of dissections made by his own hand.

Another of the great artist-anatomists of this period was Raffaello Santi, better known as Raphael, again painter, sculptor, and architect, who won triumphs as lasting as those which fell to the lot of his illustrious contemporary and rival. Raphael's knowledge of anatomy was not perhaps as deep as either that of Leonardo or Michel Angelo, but it must be remembered that fewer years were allotted for the consummation of his goal, for the grim-reaper claimed him before he had ended the fourth decade of his brilliant career. It is nevertheless shown by his anatomical sketches that he not only appreciated the importance of the science, but that he was well informed on those portions of it which are of most concern to the artist. Among his drawings deserving of special mention as particularly remarkable for its fidelity to nature, is a study of the skeleton intended to give him an exact indication of the direction of the limbs and the position of the joints of the swooning virgin in his picture of the entombment.

To this list may be added the names of Rosso de Rossi and Benvenuto Cellini, both of whom studied anatomy by the practice of dissection, and made many realistic anatomical drawings, some of which are still preserved. Rosso de Rossi holds the distinction of having been the first artist to attempt to prepare a

volume on anatomy for the use of painters; unfortunately, however, he did not live to complete his work. The one plate, showing the bones and muscles, given to the world as an earnest of his good intentions, is, however, so rich in strength and accuracy that it has been mistaken for the work of Michel Angelo himself. Benvenuto Cellini became associated with the eminent Florentine physician Vidus Vidius, whose book on anatomy was not published until long after his death, but it is believed that Cellini greatly assisted him in its preparation.

Up to this time the art of the fifteenth and the first half of the sixteenth centuries bore little relation to medicine, if we leave out of consideration the drawings of Leonardo da Vinci. While great artists left accurate record of all that their dissecting-room experiences had revealed, two of the most distinguished physicians of the age, Magnus Hundt, of Leipzig, and Lorenz Phryesen, of Colmar, for some unaccountable reason, had recourse to the crude

Drawing of muscles by Leonardo da Vinci.

drawings in the anatomy of galen to illustrate their own treatises. In Phyresen's work, entitled "Spiegal der Artzney," published in 1518, he gives us only a wretched caricature of the skeleton, a view of the thoracic and abdominal viscera, evidently drawn from the anatomy of the dog, one or two confused sketches of the brain, and a carefully executed picture of himself seated in majestic dignity, while cringing bareheaded before him is an humble disciple, listening with undoubting faith to the pedantic utterances of his august teacher.

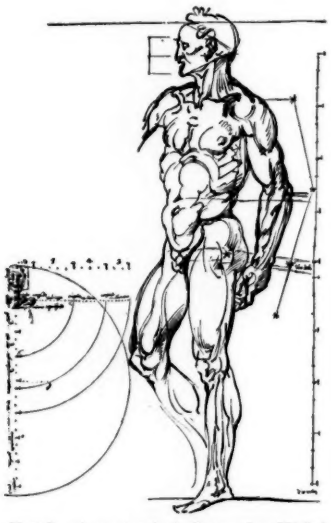
The second period, that of artistic illustration of anatomical works by wood engravings, began in the first half of the sixteenth century with the appearance of a commentary upon the anatomical work of Modino by Berengario da Carpa (1521). This work was followed in the next year by a compendium by the latter author, in which he corrected many errors of Modino, and added much new material. Both of these books were embellished with woodcuts, a few of which, chiefly myological, displayed much artistic beauty and were fairly accurate, while others were of a traditional character and in keeping with the descriptions of Galen. Berengario himself was artistically gifted and maintained relations with artists and friends of art. It is possible that he received some artistic aid from Benvenuto Cellini, with whom he was on intimate terms, and who was at that time in his early manhood. About twenty years later Johann Eichman, a professor at Marburg, issued an original composition upon the dissection of the human body, with illustrations made by himself, and engraved upon wood by his own hand.

Both Berengario and Eichman accomplished much towards the advancement of anatomical science, and opened the way for a higher school that was destined to consign that of Mondino and his contemporaries to the category of the imperfect sciences. Berengario had half caught the vision of a genuine treatise upon the anatomy of man, based upon facts obtained by actual dissection, but the consummation of such a work was reserved for a far greater mind—that of the immortal Belgian anatomist, Andreas Vesalius.

Vesalius was born in Brussels in 1513. At the age of twenty-four he went to Italy where he pursued the study of anatomy, with unremitting zeal up to the time of his death, which occurred October 15, 1564. In 1847, his native city of Brussels erected a magnificent bronze statue to his memory.

The student of medicine of the present day, who recognizes the name of Vesalius only in association with a small and insignificant foramen in the base of the skull, can hardly realize that it is to his great genius we owe the entire scheme of human anatomy, as a study involving accuracy of observation and description. Yet this is true, for to turn from the pages of his predecessors to the works of Vesalius, is to step from the bewildering glim-

mer of supposition and tradition into the light of fact and order. It is to be especially noted that, from the first, the great teacher availed himself of the assistance of the artist, and directed his interpretations of the subject at every step. It is possible that he himself learned much in teaching his associates, and it is certain that the value of his own labors was



Sketch of anatomical figure by Michel Angelo Buonarroti.

greatly enhanced by the skilled pencil which wrote his story in characters that all men could understand.

As the designers of the Vesalian illustrations many famous artists have been named, among them Tiziano Vecelli, Christoforo Coriolani, Titian, and his illustrious pupil, Jan Kalkar. It is probable that all of these contributed to his works. To the divine Titian has been ascribed the superb figures which illustrate his great work, "De Humani Corporis Fabrica," which raised Vesalius to an eminence that no other anatomist had reached before, and fastened to his name the title of Father of Modern Anatomy.

His "Magnum Opus," the illustrations of which are accredited to Jan Kalkar, was published in Basle in 1543. To men of science it was a revelation as an example of unprecedented anatomical research, and to the disciples of art the volume has always been precious on account of the harmonious union of strength and truthfulness in the designs, and beauty and symmetry of the forms. The bones and muscles are reproduced most skilfully and with greater anatomical exactness than had ever been attained before; the viscera, vessels, and nerves were less successfully portrayed, but it is true that the anatomy of these parts was, at that time, not so well understood. The main features, however, were faithfully described and portrayed, and the work as a whole was a miracle of wide and original research. It is difficult to say whether it was the text or the illustrations that exerted the greater influence over the contemporaries and followers of the author, but for a century afterwards the anatomists of Europe did little more than to compose variations upon the united achievements of Vesalius and Kalkar.

Vesalius was not without rivalry in the field of anatomical reasearch. In 1545, two years after the appearance of the "De Humani Corporis Fabrica," a French physician named Charles Estienne published a book descrip-

Jan Kalkar's drawing of the skeleton for "De Corporis Humani Fabrica" by Andreas Vesalius.

tive of the dissection of the various parts of the human body, in which he used woodcuts of a most curious character. The author, whose work was commenced long before the appearance of that of Vesalius, was a practical anatomist and, although an original worker, he was far inferior to Vesalius, and made use of art in a much less intelligent way. In Vesalius the illustration though of the highest merit, was always subordinate to the subject of the text, while in Estienne's cuts the

anatomy often appeared to be little more than a medium for the fanciful ideas of the artist. Some of the drawings were, indeed, very striking as artistic compositions, but the figures were often placed in queer and repulsive positions, while the introduction of many non-essentials rendered the anatomical parts small and indistinguishable; as for example, a plate showing the entire form of a man in the foreground of a pastoral landscape, his calvaria hanging from a limb of a tree above his head, while his denuded brain turned towards the observer represents all the anatomy to be seen in the whole picture; and another, a full length nude figure of a woman seated in a chamber of classical design, has no other purpose than to display the contour of the external genitals. Nevertheless, except in the case of the muscles, which were miserably portrayed, the anatomy of Estienne's plates was for the most part fairly true to nature.

Another competitor of Vesalius, and a far more serious one, was the Italian physician, Bartolomeo Eustachio. He, more than any other anatomist of his time, enriched his science by accurate investigation. His published work on the anatomy of the kidney was an admirably thorough piece of original research. He also engaged in pathological research and is said to have been the first anatomist to introduce postmortem examinations in Roman hospitals.

Eustachius himself made most of the drawings to illustrate his anatomical writings, others were made by his relative and assistant Pier Matteo Pini of Urbino. Only eight of his drawings appeared during his lifetime, in connection with his "Opuscula Anatomica," published in 1564. Thirty-nine other engravings made by him remained unused until a hundred and forty years after his death, when the papal physician, Giovanni Lancisi, found them with the heirs of Pini and published them with his own commentaries in 1714. Despite their long slumber, the pictures were so little behind the age when they were introduced to the world that edition after edition was called for, the demand ceasing only at the beginning of the nineteenth century. The drawings were indeed in some respects even richer and more trustworthy in detail than those of Vesalius: and, although both drawing and engraving were feeble and inartistic, the scientific value of the plates more than counterbalanced their aesthetic imperfections.

The third period, extending from the middle of the sixteenth to the early part of the nineteenth century, may be called that of artistic engraving on copper. The process was not a new one, but had been practiced long before this time, at least as early as 1461, but no extensive use of it had been made in medical illustration before the seventeenth century, and the few examples that had appeared in medical books were of small artistic importance as compared with the contemporary work of the wood engraver.

The first important medical work embellished with copper-plate engravings was the "Historia de la Composicion del Cuerpo Humano" (1556,) by Juan Valverde de Hamusco, a Spaniard, who had studied anatomy under Colombo and Eustachius. The illustrations in this book were mostly copied from those of Vesalius, but the engraving on copper was skilfully done. One plate, however, not taken from Vesalius, is interesting as a curious instance of the tendency shown by the old anatomical artists to make the most

Anatomial figure by Juan di Hamusco.

of the subject from their point of view. It represents the figure of a man who, having just succeeded in divesting himself of his skin, stands in a pose of dignified self-approval, grasping the knife dripping with blood in one hand, while with the other he holds up to view his detached integuments, from the midst of which the flabby features of his face stare in feeble disapproval at the spectator.

The use of wood engraving in the embellishment of anatomical works did not end with the advent of copper-plate etching or afterwards, but it ceased to hold the important place it had hitherto occupied as a means of artistic expression. Many writings of great value, however, such as the contribution of Constantio Varoli to the anatomy of the brain ("De Nervis Opticus," etc., 1573), the "Historia plerarumque partium Humani Corporis" (1585) of Solomon Alberti, and the artistic treatise "Varia Commensuracion para la Escultura y Arquitectura" (1585) of Juan de Arphe were illustrated by woodcuts; but the power that stamped the cuts in Vesalius had disappeared.

In the seventeenth century copper plate engravings, which had been used for anatomical illustrations in the preceding century by Eustachius, held undisputed sway. The anatomical works of Giulio Casserio (1627), and those of his successor in the chair of Padua, Adrian van de Spieghel (Spigelius) were copiously and artistically illustrated by this process. Another valuable set of drawings was made a little later by the famous artist, Pietro Berretini of Cortona, for the anatomist Johannes Maria Castellanus, and skilfully transferred to copper, but, unfortunately, these plates, like those of Eustachius, remained hidden, and it was not until a century later, in 1747, that they were discovered and published; a lapse that was the more to be deplored since they gave to the anatomy of the nervous system an artistic manner of representation and accuracy of detail not equalled by any of his predecessors.

In the drawings of Berrentini, as in most cases where artists have interested themselves in the work of the anatomist, the grimness of the motive disappears under the artistic touch which injects life, and even humor into the composition.

The great landmark of progress in the still somewhat barren field of medical science, the immortal "Exercitatio Anatomica de Motu Cordis et Sanguinis" by the celebrated English physician, William Harvey, was published in 1628, but the book owed nothing to the quality of the copper plates which illustrated it, nor did English art make a creditable showing in any of the anatomical publications of the seventeenth century. The plates of Samuel Collin's "System of Anatomy," published in 1685, though executed by one Faithorne, considered the ablest engraver of his time, displayed little excellence, while those of a contemporary treatise upon the muscular system by John Browne, a surgeon of London, have even less claims to artistic merit.

Anatomical figure by Peter Paul Rubens.

The dissected figures in the latter case, drawn with pretentious badness, are placed in the most curiously affected and self-conscious attitudes, as though proud of the exhibition of their anatomical details. The pictures, however, were interesting from the fact that the names of the structures were, for the first time, engraved on the parts, a practice afterwards followed by Gray and Holden, and which has continued its popularity to the present time.

The palm of artistic pre-eminence in the medical books of the seventeenth century belongs to Holland. The publication in 1865 of the "Anatomia Humani Corporis" of Godfried Bidloo, a professor of anatomy at the Hague and Leyden, did not contribute much to science, but the author had the sagacity to associate with himself in the work the eminent artist, Gerard de Lairesse of Amsterdam, and was thus enabled to produce a book which to the present day has remained greatly prized, if little read, for the accuracy and strength of the drawings. Some of the plates, however, are too naturalistic both for art and for science, but in two of the osteological designs, which are particularly noteworthy as works of art, the temptation to pictorial dis-

play is too strong for the artistic mind to resist; in one of these, a figure standing within the entrance of a sepulchre holds up an hour glass as if to remind us that our condition is separated from his only by the moments of passage of a few falling grains of sand; and in the other, the animated skeleton is seen descending into the grave, not without a certain grace and dignity, to escape from a world where the grim simplicity of the uncovered bones could find neither condolence nor repose.

Before leaving the seventeenth century, it may be stated that the two greatest artists of that period, Rembrandt and Rubens, have left their impress in connection with medical science: Rembrandt in his celebrated picture of the physician Van Tulp demonstrating the structures of the arm to some of his compatriots (painted 1632), as well as two other works less known, and Rubens by several bold and characteristic studies of the surface anatomy of the body.

In the next century (the eighteenth), anatomy was elevated by the publication of some splendid anatomical atlases, printed in the most expensive style and embellished with exquisitely engraved plates. Practically, there was but one method of reproduction during this period—that of etching on copper—for the wood block had fallen from the high rank it formerly occupied, and produced no more pictures like those engraved for Guido Guidi and Vesalius.

The list of important works is too large even to name, but as examples for beauty of illustration may be mentioned the "Osteographia, or Anatomy of the Bones" by William Cheselden (1733); the "Tabulae Selecti et Musculorum Corporis Humani" of Bernhard Siegfried Albinus of Leyden (1747) and the "Anatomia Uteri Humani Gravidi," by William Hunter (1774). Cheselden, a man of artistic taste, spared neither trouble nor expense to secure the most artistic reproductions of his specimens, but he was above all a man of science, and he was equally as zealous that they be accurately presented. The result was, as would be expected, a magnificent volume of great artistic excellence as well as fidelity to nature. The "Osteographia" was a distinct contribution to the anatomical science, and an ornament to the medical literature of the day.

The Atlas of Albinus was even a more scientific work than that of Cheselden. Myology had been well and broadly treated in the illustrations of many preceding works, but the detail of form and attachments of each individual muscle were represented in this book for the first time, and the task was performed with so much thoroughness that little has remained to be added. The drawings of the various figures displayed great skill and accuracy and, although the artist lacked ability to reproduce the tectorial character of the structures, he so ably preserved the essential truths that the great atlas fully merits the high rank it held during three generations as a standard of reference both for artist and anatomist. It was not until the middle of the nineteenth century that its place was taken by other works more suitable to the requirements and pocket of the student. An illustrated volume by the same author confined to osteology, "Tabulae Ossium Humanorum" (1784), is especially to be remembered as being the first attempt to show the exact area of muscular and ligamentous attachments upon the bones.

William Hunter's treatise on the Gravid Uterus ranks with Cheselden's "Osteographia" as an ornament to the library, for the best art available at the time had been used on a subject that would appear to be little capable of aesthetic treatment. The foremost artists of the day were employed upon the plates, and one of the number, the famous Sir Robert Strange, is said by Hunter himself to have given "his advice and assistance in every part of the work with a steady and disinterested friendship."

The fourth or modern period of anatomical illustration may be dated from the close of the second decade of the nineteenth century. Art has become more and more essential to medical science as an aid both to record and expression. The diagram, the more highly finished drawing, and the model serve as a new language that speaks with strength and clearness where written or spoken words would convey their meaning slowly and imperfectly. The new period has been characterised by the multiplication of methods of pictorial reproduction. Engraving on copper, which stood at the forefront during the last period, gave way to cheaper and more readily adaptable processes. Of the new processes, lithography, invented in 1796, was destined to hold an important place in medical illustration, as was also photography and photographic processes of engraving which came in use later on.

XUM

The first medical essay of moment in lithography appears to have been the engraved plates of the "Arteries," published by Friedrich Tiedemann, in 1822, but the result here was by no means striking. It was not long afterwards, however, in 1831, that Jacob, the father of the modern French school of anatomical drawing, unveiled the possibilities of engraving on stone in the great anatomical work of Bourgery. This magnificent achievement of Jacob's gave a wide impetus to anatomical illustration by the new process, and many works of high scientific value and artistic excellence, illustrated in this manner, made their appearance in rapid succession. The most important of these, from an artistic point of view, was Hirschfeldt's "Anatomie du Systeme Nerveux" (1853). The illustrations for this work were made by the French artist Jean Leveille, the favorite pupil of Jacob. This gifted man was an accomplished anatomist as well as artist and thus combined in his person a profound knowledge of the subject with an ability to depict it in the most skilful and accurate manner. In the designs for this book, Leveille reached the highest point of artistic excellence and placed France beyond rivalry in anatomical illustration. Another book illustrated by lithographic plates, deserving of mention, is the "Anatome Artistic du Corps Humain" by Dr. Paul Richer of Berlin. This is the best treatise on Artistic Anatomy that has ever been written, and is unique in the fact that this talented physician not only wrote the text but also made the drawings to illustrate it.

Since the advent of lithography, the process has been carried to such a high degree of development, that by this method we are now enabled to utilize colors in reproduction in so perfect a manner as to give to the structures an appearance closely resembling their natural state. Multicolor lithography, as it is called, has been most successfully employed in medical illustration. The first and, up to this time, the only anatomical work to be printed by the color process has been the beautiful Atlas of Johannes Sabotta of Wurzburg. The superior quality of the drawings and the life-like effect given them by the colors renders this book a valuable contribution to the anatomical science.

Photographic processes too have made rapid strides of advancement. The half-tone method, based on photography, gives most excellent results, and is now even more extensively employed for book illustration than is lithography. The advantage of the half-tone, aside from its cheapness, is the unerring exactness with which drawings are reproduced. This process is well exemplified in Spalteholz's magnificent Atlas, and the monumental work of the American anatomist, Dr. George A. Piersol of the University of Pennsylvania. It is needless to add that, in all reproductive work, the merit of the illustration depends not so much upon the manner of its reproduction as upon the deft hand of the artist who fashioned it.

In conclusion, the service that art has rendered to anatomy is sufficiently apparent, even in the few pictures I am able to show you tonight. We all know the great advantages to be derived from book illustration as a means of fixing and clarifying our knowledge, and how often an accurate picture appears to us like an oasis in the midst of a desert of unintelligible text. It is true that pictorial anatomy, like every other good thing, may be misused. It is a poor substitute for direct personal study and examination of the structures themselves, although for many parts of the body it is a necessary one for the ordinary student, but it is always an efficient preface and an invaluable sequence for such parts, for it shows us better than any written description what to look for, and it recalls to us what we have seen.

The service that a love of art may confer upon us personally and individually is a matter of a different kind. The study of art is a mental culture of the highest order; it gives a training to the eye and hand of inestimable value to the surgeon and the anatomist, and there is no diversion that can reflect more rays of sunshine across the dull shadow of the daily routine of our professional life. The medical profession has numbered among its ranks many distinguished patrons of art, and not a few men who have displayed a power of artistic attainment that would have made them great artists, had not their destiny guided them to eminence in the medical sciences instead. In this class belong the famous anatomists, Bell, Maclise, Holden, and Godlee of England, and Keen, McClellan, and Spitzka of our own country. Though better known as anatomists,

they were artists as well and, by their achievements, added lustre to both professions.

Of the possession of a skilful knowledge and facility of drawing to a teacher of anatomy, little need be said, for it is obvious that one who can demonstrate an idea clearly and succinctly by a few strokes upon the blackboard will, other things being equal, best claim and hold the attention of his students and let them leave with the most lasting mental impression of the subject of his lecture.

THE RELATION OF BIOLOGY TO SURGERY.*

By J. SHELTON HORSLEY, M. D., Richmond, Va.

The privilege of addressing the members of the Atlanta Academy of Medicine, of the Fulton County Medical Society, on such an auspicious occasion as the opening of their new home, is an honor that I greatly appreciate. There is a spiritual inspiration about the dedication of a monument, the unveiling of a statue, or the opening of a home that is hard to estimate. It seems to mark a distinct era in the lives of the individuals or of the society for which such an event occurs. It offers an opportunity for resolutions of doing better work, for broader vision, for greater brotherhood among the members of the medical profession that are directly concerned in such an event, and for an elevation of ideals that will not be satisfied with anything but the very best in scientific medicine and surgery. It is a great privilege to be a participant in such an event.

I have chosen for the subject of my address "The Relation of Biology to Surgery," because I feel that the future of both medicine and surgery is very intimately involved in the proper appreciation of biologic principles. Biology covers, to be sure, a wide field and is often rather vaguely defined. I am using it as the science that has to do with living tissue in its various manifestations. This necessarily embraces physiology, because physiology is a study of normal function, as well as pathology, which broadly includes the study of abnormal function and of diseased tissue. In the living body, all the reactions of tissues to disease or trauma are biologic processes.

In the science of medicine, as in religion, certain great prophets stand out who mark the way and whose teachings and vision are too frequently neglected until succeeding generations. The work of such a man as John Hunter is classic on account of the marvelous accuracy of observation and the logical deductions from the observed facts. The epoch-making works of Pasteur and of Lister are now fully appreciated. In this goodly company there is a man whose reputation is less widely known, and yet, though his chief work is contained in the lectures given at the Royal College of Surgeons in England in 1860, there is an amount of accurate observation and philosophical deduction that should be the admiration of every physician and surgeon. I refer to the lectures of John Hilton, which were published under the title of "Rest and Pain." Pre-eminently, he emphasized the causation of pain as a protective phenomenon and the beneficial influence of physiologic rest. He may be considered a pioneer in thus calling attention to the great value of the observation of biologic principles in the comprehension and the treatment of disease.

We of the medical profession are sometimes too often inclined to confuse the relation of cause and effect in treating disease. This applies not only to pharmaceutical remedies but to surgical measures. Accurate observations such as Hilton's frequently clear the atmosphere and show a sharp outline of the true condition. Particularly in surgery, we must never forget that the patient is a highly organized mass of living tissue, every cell of which is capable of a certain definite reaction to trauma or disease. Surgical operations that look well on a cadaver may be utterly unsuccessful on a living human being. A beautiful operation that results in the death of the patient is not satisfactory surgery. The mechanical portion of the technic is important, but it should not entirely dominate. The ideal is to be thoroughly imbued with the principles of the biologic sciences, thoughtfully to apply these principles, and at the same time to be mechanically skilful.

The science of anatomy is essential to the mechanics of surgery. He would be a poor locomotive mechanic who did not understand the construction of his engine; and in operations on the neck, for instance, a surgeon who is ignorant of anatomy would be like the proverbial bull in a china shop. A knowledge of anatomy is essential to good surgery, but

*An address delivered December 7, 1922, by invitation, at the opening of the new home of the Atlanta Academy of Medicine of the Fulton County Medical Society.

in the ever shifting problems of tissue repair and metabolism, physiology is just as necessary. The principles underlying an operation are correct only if they conform to the laws of physiology and of repair of the tissue or organ that is affected. If we could get away from blindly following what some one says merely because he says it, and do things because of reasons that have sound biologic foundations, we should undoubtedly do work more satisfactory to our patients and to ourselves.

The ideal in surgery should be first of all a thorough and complete removal of the pathology, and a close second to this should be restoration of the physiologic function. These ideals cannot be intelligently even approximated without a consideration of the biologic principles not only that accompany the disease, but that are an essential part of the process of repair after an operation or of the readjustment of the tissues because of changed anatomical relations brought about by operation.

Drainage.

Probably we can best illustrate the intimate relation which biologic processes have to the mechanical procedures in surgery by considering surgical drainage. An appendicular abscess is opened and drained by the insertion of a tube *down* to the abscess. The pus is drained uphill. There is no effort to secure dependent drainage by gravity, and yet the vast majority of these abscesses heal satisfactorily with this treatment. An abscess of the same kind of infection in the muscular tissues or in the pleural cavity would probably not heal unless drainage was made at the most dependent portion. Why, then, does this abscess heal readily when drained from its roof, whereas the same type of pus elsewhere requires gravity drainage?

It is common knowledge that gauze drainage is often beneficial. A cigarette drain carried to the bottom of an abdominal wound with local peritoneal infection limits the inflammation and promotes cure, but if we were to examine this drain within twenty-four hours after being placed, we would find the meshes and fibers of the gauze plugged with coagulated lymph, so instead of acting as a drain it really becomes a plug—yet it is a common experience that this is a very beneficial procedure, and often the gauze drainage is better than a tube. Surely such contradictory conditions cannot be reconciled by any law of mechanics.

Let us consider the biologic processes that may explain the beneficial effects of surgical drainage.

First of all, we must recognize that the body has certain definite biologic defenses against trauma and disease. These defenses are usually not perfect, and sometimes are quite feeble, but with very few exceptions they exist. The defenses against the injurious effects of foreign substances in the epithelial lined cavities where such substances are prone to lodge are highly specialized. Thus, the stomach emits, by vomiting, food that is spoiled and many irritating drugs. Excessive salivation which accompanies nausea tends to dilute the offensive material and to protect the mucosa of the mouth and the esophagus. Irritating material in the nose produces a profuse secretion which may wash away the irritating substance, and sometimes there is sneezing which is a violent propulsive force. In the eye a cinder causes spasm of the eyelid and a flow of tears to wash away the cinder. An irritating body in the larynx, bladder or rectum immediately calls for spasm. In the endothelial lined cavities, however, and in solid tissue, the chief, if not the only, method of extruding an irritating foreign substance is by a flow of lymph. This is such a common occurrence that we are inclined to overlook it. If a boy sticks a splinter in his toe, it may not annoy him for one or two days. Then there is some swelling about the splinter, and the tissues around it "fester." For some days there is a discharge of pus, which becomes thinner, and then on inspection a small black speck can often be seen. If he is a normal country boy, his mother usually picks out the splinter with the point of a needle, and the discharge ceases by the next day.

This homely illustration demonstrates the foundation principles of surgical drainage. An irritating substance in solid tissue or in a serious cavity causes the lymphatics in the neighborhood of the irritation to pour out abundantly lymph or serum around this foreign body. If bacteria are present, pus is formed and this augments the flow of lymph because it adds an additional irritation. The splinter, for instance, which was firmly fixed in the tissues at first is somewhat loosened, and the constant flow of lymph around it tends to wash the splinter toward the surface along its track of entrance. After its removal there

is no longer a stimulus for the flow of lymph, and the wound quickly closes.

These phenomena are well known in surgical experience. The beneficial results of surgical drainage, then, come partly from relief of pressure in a suppurating cavity, which thus lessens the absorption of the toxic products, and partly from the stimulus to the neighboring lymphatics to pour out the lymph or serum into the drainage tract. This explains why an uphill drainage will be satisfactory in the abdomen, but not in the pleural cavity or in the solid tissues of the thigh, for the peritoneum is a huge lymphatic sac, and its lymph supply is so abundant that the irritation from the foreign substance of a drain, plus the local infection, will direct an ample lymph stream along the drain and so wash out from the peritoneal cavity the bacteria and their toxic products that would otherwise be absorbed. In solid tissues or in the pleural cavity where the lymphatic supply is much less than in the peritoneal cavity, there is not enough of the serum or lymph available to clean the abscess cavity, so that toxic products cannot be satisfactorily eliminated solely by the outpouring of lymph. Consequently, gravity must be invoked.

Gauze is more irritating than rubber. The application of dry gauze to a wound is quickly followed by an exudate of lymph. Nature pours into the meshes of the gauze an abundant quantity of lymph in an effort to extrude the gauze, which is irritating. For this reason we will cover a fresh wound with gauze when pus must be evacuated over the wound, and we are accustomed to see very little contamination of the raw surface if it is thus protected. The gauze reverses the normal lymph flow, and the lymph supply is poured out into the gauze instead of absorbing the toxic products of the bacteria. For this reason a cigarette drain is often of more value in limiting infection and directing the lymph current toward it than would be a tube. The combination of a tube and a cigarette drain in large cavities is frequently most effective.

Hyperemia.

The principles that govern repair and nutrition are the underlying essentials of most surgical procedures. Nutrition comes largely or entirely through the blood stream, and depends upon the caliber and the character of the vessels which deliver the blood, the capillaries which distribute it, and the veins which return it—as well as upon the quality and quantity of the blood itself.

Walter B. Cannon, of Harvard, has shown the very striking influence emotions may have upon the quality of blood and upon its distribution. He has found that under great emotional or physical strain an excessive amount of sugar is often found in the blood and this produces a temporary glycosuria. The secretion from the adrenal glands apparently continues the impulses that are initiated by the sympathetic system and puts the body on a war footing. This lessens the peristalsis of the intestines, increases the action of the sphincters, dilates the bronchioles, increases the caliber of the arterioles to the muscles while constricting the arterioles of the body surfaces, and dilates the pupil. All of this mobilizes the energies of the body, and temporarily interferes with the absorption of nutrition from the gastro-intestinal tract. Such a process may amount to little if it is temporary, but no one can doubt that the condition of the war footing produced by the emotions, added to the necessary strain of the surgical operation, to some extent increases the risk. This, then, shows the necessity for the conservation of the patient's energies by measures that tend to prevent a useless exhibition of the patient's emotion of fear or anxiety.

The problem of local hyperemia has not infrequently been a puzzling one. Occasionally therapeutic measures have been adopted along the same principle that Hertzler says some surgeons utilize in the abdomen, namely, when an organ is tied up by adhesions, the adhesions must always be released, and when it is free, adhesions must be created. Too often there has been a tendency arbitrarily to decrease hyperemia when it is present, or to promote it when absent, without regard to what will be accomplished by such procedures. The old method of treating subacute or chronic inflammation of the joints or tendons was to paint the skin over the affected part with iodine. This was done on the theory that the application of iodine would draw blood *from* the injured region, and so by relieving congestion would benefit the inflamed tissues. It has been well known that such applications are often beneficial, but we are now aware that the benefit is attained not by drawing blood *from* the tissue, but by bringing more blood *to*

the injured tissue, and so increasing the metabolism and nutrition that a more rapid repair can take place. How often we see a chronic indolent wound that heals after a vigorous application of nitrate of silver, which cuts down the superficial granulations. The action of the silver, of course, destroys useless and poorly built granulations, but probably its chief beneficial result is the creation of an increased hyperemia, which will permit the construction of proper granulations that will go through the normal cycle and result in scar tissue and healing.

Some chemicals promote a hyperemia more readily than others, but may also produce too much local destruction. The silver preparations are remedies that seem to cause a maximum amount of hyperemia and a minimum of destruction of tissue. Frequently, too, such applications are followed by relief from pain in painful ulcers, where nothing else is effective. In such instances there is doubtless an ischemic pain in which the nerve fibrils do not receive a sufficient amount of blood for their needs, and consequently register pain until the hyperemia relieves their distress.

The influence of hyperemia in tuberculous diseases has long been known. This has been utilized to the benefit of the patient by the method of Bier. The pathologic process in the formation of the tubercle causes a hyalinization of the minute blood vessels, so that in the tubercle is a giant cell, with surrounding tubercle bacilli and epithelioid cells, to which there is practically no blood supply. If we can flood the tubercle with rich blood, the tuberculous process is overcome and nutrition is sufficient for the formation of normal granulation tissue and healing by scar formation. Blood is a great enemy of the tubercle bacillus, which in most tissues can only live because of the pathologic processes tending to decrease or shut off the blood supply to the tubercle.

It is doubtless within the memory of many surgeons and physicians when tuberculous ascitic peritonitis was treated in many weird and fanciful ways. One surgeon would make a long opening, evacuating the fluid and manipulating the intestines. Another, after incision, would dust the peritoneal cavity with some particular preparation. Still others insisted upon letting the sunlight in. Many used drainage of various kinds. A large percentage of cases of ascitic tuberculous peritonitis recovered after these operations, and each surgeon was thoroughly convinced that his own method was the peculiarly correct one. It was some time before it was discovered that the evacuation of the fluid and the manipulations produced a hyperemia, and it was the hyperemia that cured.

But excessive or constant hyperemia may not be an unmixed blessing. Just as over-nutrition has a deleterious action on the whole body, so over-nutrition of local tissue by excessive hyperemia may have a harmful effect. It must be constantly borne in mind that nature in what we consider normal moods does not deal in excesses, but in a happy mean, and this frequently is within narrow limits. Too much food produces disease just as would too little or improper food. For every set of flexor muscles there is a controlling set of extensor muscles. Regulation of the heat mechanism is wonderfully delicate, and provides for a practically constant body temperature in mammals. Excessive acute active hyperemia may defeat its own purpose by causing stasis and clotting, and so filling the vessels with clots as to decrease nutrition at a point where it is most needed. Chronic hyperemia may produce excessive scar tissue. Hyperemia may render the nerve terminals supersensitive, so that they are supersensitized to pain. This is one of the reasons why hyperemia around the point of inflammation produces marked tenderness and pain. This, too, in turn is often a protective mechanism, which tends to keep the part at rest and to protect against trauma.

Recent researches by Krogh, Hooker, Danzer and others have thrown much light upon the physiology of hyperemia. (Evidence of Functional Activity on the Part of the Capillaries and Venules, by D. R. Hooker, Physiological Review, Vol. 1, No. 1, pp. 112-141). It has formerly been considered that hyperemia was dependent upon the arterioles: that the action of the muscular coat in these small blood vessels largely controlled the supply of blood to the tissues. As the histology of the capillaries shows only a layer of endothelium without any muscle, it was assumed that the capillaries possess no power of contraction. It has been proved, however, that this is not true, and that the capillaries have a wide range of contraction or dilatation, even though they do not possess a muscular layer. This seems to be due to the alteration in the size of the endothelial cells composing the capillaries, and is effected by chemicals or by nervous stimuli.

Broadly speaking, dilatation of the capillaries and venules seems to be caused by chemical stimuli, and contraction by nervous impulses. Histamine produces strong contraction of smooth muscle in the arterioles, but causes an intense dilatation of the capillaries and of the venules. The venules have a connective tissue layer in addition to their endothelium, but no muscular coat. The toxic products of wound shock have been shown by Cannon and others to have an action on the capillaries similar to the action of histamine, which appears to be a poison to the endothelial cells of the capillaries and venules, causing them to shrink. Thaysen has ascribed the remarkable variation in the number of red cells in a case of polycythemia to changes in the tone of the capillaries and precapillaries of the skin.

Surgery of the Blood Vessels.

The surgical treatment of slow or threatened gangrene has been much discussed. Carrel and Guthrie, in 1906, after two experiments, concluded that the blood circulation in the leg of a dog could be completely reversed within six hours. They severed the femoral artery and vein just below Poupart's ligament and united by suture the cardiac end of the artery to the distal end of the vein, and the distal end of the artery to the cardiac end of the vein. After a few hours, when red blood was seen returning, they assumed that the circulation was reversed. I think it can now be stated, however, that it is impossible to reverse the circulation in this manner. In a series of experiments which have been reported, we have shown that when the severed femoral artery and vein of animals are sutured together in a reversed direction there is no real reversal of the circulation, and the arterial blood never goes more than a short distance below the knee and is then quickly switched back to the iliac veins through the dilated collateral vessels. Instead of the heart action mechanically breaking down all the valves in the vein, it biologically strengthens most of them. Evidently what happened in Carrel's experiments was that dissection paralyzed the vasoconstrictor nerves, and the dilated capillaries permitted red arterial blood to flow through unchanged. When the sciatic and crural nerves are divided in a dog, red blood appears in the femoral vein because of the extreme dilatation of the capillaries. Clinically, this is often seen to follow an application of the elastic tourniquet which, if left on for even a short time and removed, produces an intense flushing of the limb until the temporarily paralyzed vasoconstrictors have resumed their function. Many useless operations have been done attempting so-called reversal of the circulation in threatened gangrene. The only good accomplished was damming back the venous blood and forcing the small amount of arterial blood that reached the tissues to stay longer than it normally would and so deliver to the tissues more nutrition than would be possible when the arterial blood was quickly drained off by unobstructed veins. This can be very simply effected by ligating the femoral vein.

Surgery of the blood vessels shows the application of biologic principles. In young individuals the main arterial trunks can usually be ligated with the preservation of the nutrition of the limb. This, however, is not invariably true, for ligation of the popliteal artery or of the lower portion of the brachial artery may be followed by nutritional disturbances, or even by gangrene. In a few instances the wounds of blood vessels can be sutured, and even a section of a vein may be transplanted between the ends of an artery where it is necessary to remove the injured segment. This work, however, requires some special training, and frequently when the operation is indicated the conditions are such, as in military surgery, that make efforts at immediate arterial suture unwise. Later on, if an arterio-venous aneurysm forms and the coats of the vessels become infiltrated with scar tissue and thickened, arterial suturing with the delicate needles and silk as used in the experimental laboratory is impossible of application. If there is any reasonable doubt of the collateral circulation around an aneurysm, tests which have been described by Matas should be employed before the artery is tied. The circulation, however, can be improved by pressure over the main trunk for a limited time each day, or by the application of the aluminum band which has been devised by Halsted and by Matas, and which can be so adjusted that the lumen of the vessel is not entirely occluded. After this band is left on for several days or longer, the collateral circulation may be developed to an extent that complete occlusion of the main arterial trunk will be safe. Such a procedure in ligation of the common carotid artery in middle-aged or elderly patients is exceedingly important,

especially if the operation be done under local anesthesia when the ordinary tests of function of the brain can be made during and immediately after the operation.

In the preparation for the transference of a pedicle flap, the principle of development of the blood supply by gradual increase and dilatation of the vessels from one portion of the flap is exceedingly valuable. A long, narrow flap for the face can be outlined from the forehead or from the neck and shoulder or chest, and completely undermined only near its pedicle. The flap is gradually dissected free under local anesthesia, doing the work in stages at intervals of a few days. In this way the blood supply is transferred slowly to the pedicle, and the flap can be turned into position without fear of necrosis. This is probably better than dissecting the flap free except at the pedicle and replacing it in its bed, because a too violent and sudden change is made in the blood supply, which may result in a partial necrosis—whereas when this dissection is done in stages the blood vessels are gradually trained to take on the additional burden. Five days after the flap has been transferred into position, a soft-bladed clamp or a rubber band is placed on the pedicle for fifteen minutes to half an hour. This procedure is repeated each day for a week or ten days, when the flap can be severed with the assurance that no portion of it will be lost because of faulty blood supply.

Connective tissue is a very hardy tissue. It will stand more insults and more trauma than highly differentiated tissue such as muscle or glands, and at the same time it can live on less nutrition. Consequently, the question of the amount of scar tissue after plastic operations sometimes depends upon the local nutrition, though many other things may determine scar tissue, such as infection, and the personal idiosyncrasies of the patient. Infection acts largely by destroying the more highly differentiated tissue. If, then, it is essential to avoid as much scar tissue as possible, the nutrition of the flap should be particularly considered, for if the blood supply is cut down to a minimum, scar tissue will dominate—and not only that, but infection is more likely to ensue when nutrition is at a low ebb. For the immediate vitality of the flap, for the future cosmetic appearance, and to avoid scar tissue contraction, the development of a satisfactory blood supply, by considering these biologic principles, is quite necessary.

Surgery of the Gastro-Intestinal Tract.

Surgery of the stomach frequently suffers from the lack of application of physiologic principles. There is no one operation satisfactory in all different types of ulcers of the stomach or duodenum. Much depends upon the location and the extent of the ulcer. Gastro-enterostomy has a distinct field, but only when the pyloric portion of the stomach or of the duodenum is so extensively infiltrated by inflammatory products or so affected by the extent of the ulcer or by the resulting cicatricial contraction that it would be impossible to restore this greatly damaged tissue to normal. There is an analogy between gastro-enterostomy and amputation of an extremity. When the tissues of an arm or leg have been so thoroughly damaged as to make it impossible to restore function, then amputation may be considered. So, when the pyloric outlet of the stomach or of the upper portion of the duodenum has been irreparably destroyed, a short-circuiting operation has a very proper field. Gastro-enterostomy is not a drainage operation, because the stomach is a hollow muscular organ and drainage is best assomplished by making an opening as nearly as possible in the axis of the peristaltic waves. We do not drain the urinary bladder from the most dependent portion, and we perform an enterostomy in the distended loop of bowel that is nearest the incision, and not the loop that is most dependent in the pelvis, because we know that normal peristalsis will keep the bowel empty when the opening is made. The dumping of the acid gastric juice into the jejunum, which is accustomed to alkaline contents, is certainly an unphysiologic procedure, yet amputation is also an unphysiologic procedure. Gastro-enterostomy is most beneficial when the pyloric outlet has been permanently closed, for the alkalinity of the duodenal contents remains high, and cannot be lowered by the passage of gastric juice through the pylorus. Consequently, this alkalinity can protect the jejunum in the region of the gastro-enterostomy stoma from the action of the acid of the gastric juice. However, when there is a small ulcer which can be excised, or when there is occasion to give rest and relaxation to the pyloric end of the stomach because of the excision of a gastric ulcer near the cardiac end, a pyloroplasty is indicated. By the division of the pyloric

sphincter and its adjunct gastric muscles the spasm which frequently accompanies an ulcer in this region is overcome and the stomach can empty its contents with a minimum amount of effort because of the diminished resistance at the pylorus. Here we take advantage of the general principle of physiologic rest in lessening the obstruction which would call for strong contractions in the stomach wall. In this manner the normal physiologic function of the stomach is restored.

The same principle has been utilized since the early days of surgery, in operations on the rectum, when the sphincter ani is temporarily paralyzed by division or divulsion in order to promote healing of an ulcer within its grasp or higher up in the rectum. Such a procedure not only gives rest, but provides an easy exit for the fecal contents, so there is not the same necessity for strong contractions of the colon and sigmoid which would be necessary to overcome a spastic sphincter.

It seems rather definitely settled that there is a sensory nerve supply to the stomach and intestines. It is a meagre supply, however, and the sensory nerves terminate in the muscular coats of the stomach and intestines and do not reach the mucosa. They are stimulated largely by certain types of pressure. Around the region of an ulcer they become particularly sensitive, just as the sensory nerves would be sensitive around any inflammation on the surface of the body. It is doubtless for this reason that the strong peristaltic waves produce discomfort in the region of an ulcer in the stomach or duodenum; not only are the peristaltic waves stronger than normal, but the nerves themselves are more sensitive.

In surgery of the intestine, the work of Cannon and Murphy in their studies of peristalsis after resection of the bowel has called attention to the fact that in lateral anastomosis the food must be pushed through the opening by the peristalsis in the upper end. The incision in the intestinal segments involved in the lateral anastomosis destroys the action of the circular muscles. If a pouch is left at either end, there is a potential source of trouble. In some instances, however, when the bowel is small and the mesentery fat as in stout patients, a lateral anastomosis is essential, as an end-to-end cannot always be safely done under these conditions. It is necessary to close the triangular space formed by the mesentery, as it widens to encircle the bowel, and to clamp and tie every raw surface in the mesentery before the bowel is opened. In this way infection is avoided. The bowel should also be cut from the mesenteric border outward. Whenever an end-to-end operation can be done safely, there is undoubtedly a more nearly perfect restoration to the physiologic function than when a lateral anastomosis is performed.

Murat Willis has recently advocated the so-called ideal cholecystotomy. In cases in which there are a few stones in the gall-bladder, but the gall-bladder appears otherwise normal, without adhesions or thickening, drainage of the gall-bladder, as he has pointed out, seems unnecessary, and is followed by adhesions that are frequently crippling. He opens the gall-bladder, removes the stones, and sutures the gall-bladder. In a certain limited number of cases this is an excellent procedure. It not only removes the pathology, but it does no unnecessary mutilation, and restores the gall-bladder to its physiologic normal. This, of course, is only one of the operations that may be necessary upon the gall-bladder, but it shows that here, as elsewhere in surgery, we must always remember the ideal of first removing the pathology, and then so far as possible restoring the physiology.

Neurologic and Bone Surgery.

There are many problems in neurologic surgery which require some knowledge of physiologic principles in order to be settled satisfactorily. Spiller and Frazier have demonstrated that section of the posterior sensory root of the gasserian ganglion produces what is called "physiologic extirpation" of the gasserian ganglion. It has been known for years that a nerve which is injured on the central side of its ganglionic cells does not regenerate; yet when the operation of division of the posterior sensory root for tic douloureux was suggested, it was received with some skepticism. This operation is safer than surgical extirpation of the gasserian ganglion, and is followed by less trophic disturbance. The plugging of foramina in the skull from which neuralgic sensory nerves have been removed in order to prevent regrowth of the nerves has sometimes been done with metal screws. Because an iron screw can stop a hole in a piece of wood is not necessarily a reason why it should be employed in living tissue. On the other hand, some substance that does

not cause reaction in bone is preferable. What happens after an iron screw is applied? Nature in an effort to extrude the irritating foreign substance removes lime salts in its neighborhood, the bone softens, the screw becomes loose, and the nerve can grow around it.

The fashion for plating fractures fortunately is on the decline. Hundreds and probably thousands of fractures have been plated with heavy metal plates for no reason except that it appeals to the mechanical sense and because some eminent surgeons advocated this operation. In many cases it is followed by attempted extrusion of the plate, and the plate has to be removed. To the casual observer it seems strange that permanent union does not always occur when a nice cabinet joint is made between the ends of a fractured bone, which are held securely in position by steel plates and screws. The same process goes on here as when an effort is made to plug a foramen in the bone with iron. The iron is an irritating foreign substance and, in order to extrude it, nature causes an absorption of the lime salts. As a result, a screw which may at first be firmly fixed in the bone soon becomes loose. But more important is the fact that osteoporosis is induced in this effort at extrusion, and callous formation is thereby prevented or retarded. A poorly fixed fracture without the use of metal is more likely to give eventual good results than the neatest union with heavy plates and screws.

Basal Cell Cancer.

The biologic processes that concern immunity are directly linked with the treatment of many diseases. The study of cancer, which has fascinated laboratory workers as well as clinicians, has shown that there is a tendency to resistance of most cancerous processes, and that the various types of cancer frequently develop in different ways. The basal cell cancer of the skin—or the rodent ulcer, as it used to be called—shows a very definite and constant peculiarity in that it does not metastasize, but extends only by continuity or contiguity of tissue. This is impressive when we recall that a basal cell cancer may occupy the same region of the face as the spinous cell often occupies, and consequently has access to the same lymphatics. The cells are usually smaller than the spinous cells, and should gain access to the lymphatics just as easily as the spinous cells do. It seems most probable that the basal cells are taken up by the lymphatics, but do not find favorable soil, and consequently perish; while the cells of the more malignant grades of spinous cell cancer can grow in the lymph glands and channels.

It may be assumed, then, that there is something in tissues at a distance from the basal cell cancer that causes an insuperable resistance to the cells of this neoplasm. This is not true of the spinous cell cancer, particularly of the more malignant grades, which may flourish wherever they are deposited by the lymph channels.

A crude illustration may show this biologic difference: If there was a field containing dry broom-sedge, and a fire was started in the middle of it, not only would the fire burn from this point, but if there was carried a burning brand to any other part of the field, it would also burn there. This may be likened to the spinous cell type of cancer, in which there is very little resistance to destruction by fire, even at a point distant from the original fire. If, however, the field of broom-sedge was damp, and a fire was started in the middle with a sufficient amount of inflammable material to dry the broom-sedge in its immediate vicinity, the fire would extend as far as the heat had dried the broom-sedge. If a burning brand should be carried into other portions of the wet field, it would not start a fire, because the dampness would render the broom-sedge uninflammable, unless the fire was sufficiently large to dry the broom-sedge first. This might be compared to the basal cell type of cancer.

It appears to be perfectly useless to treat an extensive basal cell cancer by operation with a knife. The tissue in the immediate neighborhood of the cancer has had its natural resistance broken down, doubtless by some product of metabolism formed during the growth of the cancer. The cancerous cells are simply implanted on the new raw surface, whose resistance against these cells has been destroyed, and they grow rapidly. In practically all cases that have become extensive, the roentgen ray or radium has been tried and has failed, so but little can be expected from this source.

The principles that appear to underlie the surgical treatment of extensive basal cell cancers demand, first of all, that the surface of the cancer be destroyed and sealed by cautery so that transplantation of cancer cells will be avoided; secondly, that the excision be done as far as possible with the electric cautery and

the raw surface be further cauterized after the excision has been completed, and, thirdly, that the raw surface be covered as soon as possible by tissue from a distance, where the normal resistance to cells from a basal cell cancer has not been destroyed.

I have had four cases of extensive basal cell cancer which seem to illustrate this principle. In each of these the cancer was removed, and a flap from a distant part was transplanted as soon as possible. In three of these there was a complete cure. In the fourth case the basal cell cancer recurred and the patient eventually died. This, however, was the strongest proof of this theory, because the cancer had invaded the antrum, and the flap was so transplanted that the skin surface was opposite a portion of the raw surface from which the cancer was removed. Too much of an effort was made to produce a cosmetic result. The carcinoma recurred at no point where the raw surface of the graft was in contact with the raw surface left by the removal of the cancer, although there was extensive recurrence where the skin surface of the flap was apposed to the raw surface of the ulcer for in such areas there could be no inhibitory effect of the raw transplanted tissue.

It seems logical to conclude, therefore, that in extensive basal cell cancers, in addition to cauterization and excision with a cautery, an important principle is to apply as soon as possible, to the raw surface from which the cancer was excised, the raw surface of a pedunculated flap transplanted from a distance. It was formerly thought that plastic operations for defects caused by the extirpation of cancer should not be done until it had been determined, after the lapse of months or of years, that there would probably be no recurrence. The idea seems to have prevailed that it would be useless to transplant a flap when cancer might recur beneath it. With basal cell cancer, however, this practice appears to be erroneous, and a flap from a distance should be applied as soon as possible after the excision of the cancer, for the flap seems to add an additional obstacle to the growth of the cancer by interposing its own natural resistance to the cancer cells.

Transplantation of Organs.

Skin grafting and transplantation of organs or tissues are dependent on biologic laws. Surgeons who have had great experience in this type of work, such as Lexer and Davis, believe that skin grafts from others than the patient are practically never permanent. They either melt away at once or, if they appear to "take," are later absorbed and replaced by connective tissue. It has been suggested that tests, as for transfusion of blood, would be of benefit in selecting a donor for skin grafting; but so far this has not been put to any extensive practice. The transplantation of highly developed organs, such as a kidney, from one animal to another, even if of the same species, is always a failure. The kidney may function for a while, but the fine biologic differences in the body fluids of the donor and the recipient cause degeneration, and the kidney eventually becomes a mass of connective tissue. This has been acknowledged by Carrel, Guthrie and others who were at one time enthusiastic about the success of such a procedure. The reconstruction of channels, as the bile ducts, from tissues that have no immunity to the irritating discharges with which they must come in contact is also unwise. Operations in which strips of fascia, pieces of vein, and other tissue unaccustomed to the action of bile are used, ultimately result in failure, no matter how skilfully the mechanical part of the operation is done. There must be some natural biologic resistance to irritating discharges by the tissues in normal contact with these discharges.

These are merely a few instances of what every surgeon sees in his work, and they illustrate the profound influence that the application of biologic principles has on surgical practice. Real progress in surgery lies not so much in cultivating the art of surgery and in striving after mechanical dexterity, which is important, but can be acquired in a few years, as in the study of biologic principles that concern function, nutrition, metabolism, and repair of tissues, and in the thoughtful application of these principles to every operation and to every method of surgical treatment.

It seems to be the duty of every disciple of medicine and surgery not only to apply biologic principles in his daily work, but to record instances in which new applications can be made. A study of nature nowhere offers a greater field than in the practice of medicine and surgery. Biologic processes are constantly before us, and their proper interpretation and application to our problems is not only a duty, but a great privilege. A discoverer of a new truth, be he ever so humble, is a great benefactor of science.

St. Elizabeth's Hospital.

XUM

THE RELATIONSHIP OF THE EYE TO GENERAL DISEASES.*

By G. B. DUDLEY, JR., M. D., Martinsville, Va.

Before beginning the relationship of the eye to general diseases, let us briefly consider the innervation of the eye, as on this anatomical arrangement depends to a large extent much ocular pathology produced by intracranial diseases and injuries.

The two optic tracts originate in the primary optic ganglia, viz., the anterior corpora quadrigemina, the external geniculate bodies, and the pulvinar of the optic thalamus, (these as you know are portions of the midbrain, and the midbrain lies in the opening of the tentorium cerebelli, and connects the pons with the hemispheres), wind around the crura cerebri, and the optic tracts terminate in the optic chiasm, which lies in the optic groove of the sphenoid bone, in the front of the infundibulum and above the pituitary body. There the optic tracts semidecussate and form the optic nerves, which continue through the optic foramina of the lesser wings of the sphenoid bone. The optic nerve has three divisions: first, the intracranial portion between the optic foramen and the chiasm; second, the orbital portion extending from the eyeball to the optic foramen; and third, the intraocular portion, which is the head of the optic nerve. The nerve pierces the sclera and choroid a little to the inner side of the posterior portion of the eyeball, and the sheaths of the nerve become continuous with outer layers of the sclera.

By this decussation of the optic nerve fibres at the optic chiasm, it is easy to understand how in various intracranial lesions, tumors, injuries, etc., we get our various hemianopsias, by which term we mean a blindness of one-half of the field of vision. For instance, if we have a lesion of the right optic tract posterior to the chiasm, we have a blindness of the right halves of both retinae and as a result the left halves of the fields of vision of both eyes will be lost. This is known as homonymous or lateral hemianopsia, and in this particular case the condition is called left homonymous hemianopsia. Therefore, a lesion on the cranial side of the chiasm and on the same side as the blind halves of the retinae will produce an homonymous hemianopsia. Bitemporal hemianopsia indicates a lesion through the chiasm, that is, the nasal halves of the retinae are destroyed. Should a lesion attack each side of the chiasm we would have a binasal hemianopsia. Bitemporal and binasal hemianopsia are known as crossed hemianopsia in contrast to homonymous. Complete blindness in the eye is produced when the lesion is anterior to the chiasm.

The third cranial (oculomotor) nerve supplies all the extrinsic eye muscles, except the external rectus which is supplied by the sixth (abducens) and the superior oblique, which is supplied by the fourth (trochlear). These nerves all originate from the floor of the fourth ventricle.

The contracting fibres of the iris (sphincter pupillae), are supplied by the third nerve, the dilating fibres (dilator pupillae) are supplied by the sympathetic. Hence, a contraction of the pupil is either caused by a stimulation of the third nerve or by a paralysis of the sympathetic, and a dilatation follows paralysis of the third nerve or stimulation of the sympathetic.

We shall now discuss the individual diseases of the brain. In *cerebral hemorrhage* we frequently find homonymous hemianopsia, mydriasis due to paralysis of the third nerve supplying the sphinicter pupillae, neuritis or choked disc, with or without retinal changes, and sometimes later an optic atrophy.

An *embolus* or *thrombus* produces the same symptoms in general as a hemorrhage and often is hard to distinguish from the latter. In a *thrombosis* of the *cavernous sinus*, edema of the lids, exophthalmus, dilated pupils, blindness, loss of sensation of the eye, etc., may result. The marked stasis of the retinal veins will distinguish this condition from meningitis, which may cause some venous congestion and a neuritis.

Tumors and *abscesses of the brain* present practically the same ocular symptoms, that is, choked disc, paralyses of various ocular muscles, mydriasis, etc. Ocular changes are invariably present in tumors and other diseases of the *pituitary* body, of which we hear so much today in the various discussions of endocrinology. Bilateral hemianopsia is frequently seen in tumors of this gland, also other ocular paralyses and symptoms of optic nerve pressure.

In *meningitis* we may have optic neuritis in

*Read before The Danville Academy of Medicine, November 14, 1922.

every stage from a simple congestion to a choked disc or atrophy, as well as various muscular paralyses.

In *encephalitis lethargica*, which we may classify as a brain condition, and of which we saw something during and succeeding the last war, the chief ocular symptoms are diplopia, ptosis, impaired accommodation, nystagmus, sluggish pupils, optic neuritis and choked disc.

In *paralysis agitans* (*Parkinson's disease*), we frequently see incomplete unit or bi-lateral ptosis, crossed diplopia for near and rarely gray atrophy of the optic nerve or nystagmus. Not long since, a patient (an old gentleman who lived in Schoolfield), with paralysis agitans, came under my observation, with a gray atrophy of the optic nerve.

Eye symptoms are highly important in *dementia paralytica* (*paresis*). There is usually a simple gray atrophy of the optic nerve with narrowing of the vision field, eventually terminating in blindness. This is usually a late symptom of paresis, but it may occur at an early period or even precede the mental disturbance. Ocular paralyses of central origin are very frequent, including the Argyll-Robertson pupil phenomenon. Pupils may be contracted, dilated or unequal.

The eye is often affected in *multiple* or *disseminated sclerosis*. From the general picture of the disease, and the ocular examination, I have seen oculists unhesitatingly make a correct diagnosis of the disease. With the characteristic intention tremor, scanning speech and limb paralyses, a nystagmus and primary optic atrophy leave little else to be desired in making a diagnosis of this condition.

Diseases of the spinal cord give rise to eye symptoms only when the region of the cilio-spinal centre is affected, directly or indirectly. Other eye symptoms occur when the disease of the cord extends to the cranial cavity or in case of complications.

Tabes Dorsalis furnishes ocular symptoms too well known for any lengthy discussion. The ocular symptoms are frequently the first noticed. Primary optic atrophy, with disturbances of vision and muscle paralyses, are the chief symptoms. The vast majority of optic nerve atrophies may be traced to syphilis, probably 70% to 90%. Nystagmus is rare. Ptosis not so rare.

In injuries of the spine, as "Railway Spine," we some times get various eye symptoms.

Under functional *psycho-neuroses* we may discuss *hysteria*, *neurasthenia*, and *epilepsy*. Unilateral diminution of vision, frequently with complete blindness, is the most usual ocular symptom of hysteria. The vision field may be contracted and the color fields reversed (i. e., green the largest, red next, and blue the smallest). Photophobia, blepharospasm, diplopia, ptosis and various anaesthesias and paraesthesias may exist. With the ophthalmoscope nothing is seen, and malingering must be excluded in making a diagnosis. The *neurasthenic* may have almost any kind of ocular complaint or pain. But we should not be too severe on this class of patients, for very frequently there is some refractive error at the root of the whole trouble, and with the proper glasses worn, the symptoms disappear.

A visual aura frequently marks the beginning of an *epileptic seizure*. During the attack the pupils are generally dilated, and there is often a spasm of the extrinsic eye muscles, with a rolling of the eyes. Frequently, epileptic-like attacks may be reduced by properly fitted glasses where refractive errors exist.

The most usual ocular symptom which we observe in *trifacial neuralgia* is the neuroparalytic keratitis. This is a form of progressive infectious corneal ulcer which is somewhat peculiar. Many think that this is proof that special trophic fibres exist in the first branch of the trifacial nerve. In practically every case, certainly that I have seen, where the gasserian ganglion or its sensory root is extirpated, these corneal ulcers develop. Personally, I think that lack of the normal sensation in the cornea to protect it from foreign bodies and dust has as much or more to do with the formation of these ulcers as the destruction of the so-called trophic nerve fibres.

The ocular symptoms of *facial paralysis* are well known to all, viz., inability to close eye of affected side, drooping of lower lid and lachrymation.

Albuminuria is the term now generally employed in discussing kidney (Bright's) diseases, and as the retina is the part of the eye most affected by renal involvement, albuminuric retinitis is the pathological condition we describe. *Chronic interstitial nephritis* is the type most commonly responsible in retinitis albuminuria. Next in frequency is the *chronic*

parenchymatous type. Subjectively, there is a diminution or loss of vision without pain, as a rule. Objectively, albuminuric retinitis is characterized by the presence of white or yellowish spots in the retina, hemorrhages, edema and blurring of the outline of the disc. These changes occupy particularly the region surrounding the disc. The white spots may coalesce, forming large irregular patches. The so-called typical picture includes the stellate figure at the macula, which consists of radiating white lines and spots, with the fovea centralis for the center. This figure, however, is often missing and must not be considered essential for a diagnosis. The ability to recognize the minute changes that occur early in the course of the renal disturbance is of far more value than distinguishing the retinal lesions themselves, as the cases are usually far advanced when true retinal changes have occurred. Here we have changes in the vascular tunics similar to those occurring in arteriosclerosis, which we will discuss in a few moments. The external puffiness of the eyelids is too well distinguished to require other than mentioning. The *albuminuria of pregnancy, uremia, eclampsia*, and *scarlet fever* present the same picture as above described.

In *diseases* of the *Blood* and *Circulatory system* we shall first discuss *Arteriosclerosis*. Among the early evidences of arteriosclerosis in the retina are great tortuosity of the small arterial twigs, irregularity in the calibre of the vessels, narrowing of the arteries, loss of transparency of the vessel walls, hyperemia of the nerve head and flattening or indentation of the veins where crossed by arteries. Among the later changes are included hemorrhages into the retina, occlusion of the central retinal artery, thrombosis of the central retinal vein or its branches, and perivasculitis, which manifests itself as white lines bordering the vessels. Hemorrhages into the retina due to arteriosclerosis are of prognostic significance; they are followed by cerebral apoplexy in more than 50% of the cases. Thrombosis of the central retinal vein or its branches has a like prognosis.

Valvular heart disease and *fatty heart* are often accompanied by hemorrhages into the retina, less frequently into the vitreous. *Aortic insufficiency* may cause pulsation of the central artery of the retina. *Endocarditis* may cause embolisim of central artery of retina. The edema caused by cardiac disease may involve the eyelids.

Aneurysm of the Aorta frequently affects the eyes, viz., mydriasis, exophthalmos and enlarged palpebral aperture due to the irritation of cervical sympathetic, or miosis and endophthalmos due to paralysis of sympathetic. This may also cause thrombosis or embolism of the central retinal artery or one of its branches.

In *Simple Anemia* and *Chlorosis* we usually find pale conjunctivae and pearly white sclerae. The fundus and disc may be pale as well as the retinal vessels. Occasionally, retinal hemorrhages are found. *Pernicious Anemia* often causes retinal hemorrhages, and the fundus is very pale. *Hemophilia* predisposes to profuse hemorrhage after injury to the eye.

In *Leukemia*, retinal hemorrhages are common, the vessels are greatly dilated and tortuous, the fundus is pale red with a yellowish tinge, and there are white and yellow spots of exudation.

Purpura is frequently accompanied by hemorrhage beneath the conjunctiva, in the retina, skin of the lids and occasionally into the orbit.

Severe hemorrhage may be accompanied by amblyopia, either temporary and accompanied by little or no ophthalmoscopic change, or permanent and followed by optic nerve atrophy. Such sudden and severe anemia may cause retinal hemorrhages.

Under the acute infectious diseases we shall first consider the diseases of childhood. Some variety of conjunctivitis usually accompanies *Scarlet Fever, Measles, Diphtheria, Whooping-Cough* and *Mumps*. During *Scarlet Fever* an albuminuric retinitis or an uremic amaurosis may suddenly develop. Optic neuritis, orbital cellulitis, choroiditis, and corneal ulcers are very rare complications of scarlet fever. Rarely in *Measles* does the conjunctiva take on a blennorrheal or diphtheritic aspect and then the cornea is in danger of ulcer formation. Muscular paralysis in the latter part of the disease, or often weeks later, is the most usual complication of *diphtheria*. Paralysis of the intrinsic muscles is by far the most common, but extrinsic muscle paralyses are not unusual. In *Mumps*, edema of the lids may occur; optic neuritis, iritis and ocular paralyses have occasionally occurred. In *Whooping-Cough*,

conjunctivitis and epiphora are common in the prodromal stage. In the convulsive stage, extensive hemorrhages, due to violent coughing, may develop.

Before vaccination was introduced, much blindness was produced by *Smallpox*. The lids and conjunctivae are often the site of pustules, and keratitis and corneal ulcers frequently develop; the ulcers frequently perforate, producing as sequelae, opacities, adherent leukoma, and even destruction of the globe.

In *Typhoid* and *Typhus Fevers* rarely there may be catarrhal conjunctivitis, ulcers of the cornea, and retinal hemorrhages. Paresis of accommodation and of the extraocular muscles may develop during convalescence.

In *Tuberculosis* we may have conjunctivitis, blepharitis, phlyctenular conjunctivitis, keratitis, interstitial keratitis, and, at times, involvement of the iris, choroid and sclera.

Gonorrheal ophthalmia and *ophthalmia neonatorum* are too well known ocular infections caused by "The Neisser Brothers" to require other than mention. Corneal ulcers, with or without perforation, may result, leading to incarceration of the iris, staphyloma, panophthalmitis, etc.

Syphilis frequently causes ocular diseases. Rarely the primary sore may occur on the lids or conjunctiva. About 35% of iritis is due to syphilis, being an early symptom of the secondary stage. Later in this stage choroiditis, chorioretinitis, optic neuritis and vitreous opacity may develop. In the tertiary stage, gumma may develop, also optic neuritis, optic atrophy and sometimes interstitial keratitis. Congenitial syphilis is largely responsible for interstitial keratitis and some congenital ocular defects. As tabes dorsalis and paresis are of luetic origin, the ocular pathology discussed under them, of course, may be said to be manifestations of syphilis.

Malaria may produce a keratitis, optic neuritis, retrobulbar neuritis, hemorrhages into the retina and vitreous, amblyopia and paresis of accommodation.

Erysipelas may cause great swelling and edema of the eyelids; following this there may be an abscess of the eyelids or an orbital cellulitis. Sometimes thrombosis of the retinal veins, optic neuritis, or atrophy of the optic nerve may follow. Several years ago, I saw a case complicated by an orbital cellulitis and abscess, which in turn was complicated by a meningitis, and death resulted.

During the past few years *Influenza* has been much in the limelight. It is practically always accompanied by a congestion of the conjunctiva or by an acute catarrhal conjunctivitis. Frequently there is severe pain in and back of the eye balls. Rarely there may be corneal ulcers, paresis of extrinsic ocular muscles, retrobulbar neuritis, neuroretinitis, optic nerve atrophy and orbital cellulitis. The extreme depression following the disease probably accounts for many of the ocular complaints credited to the disease itself.

The edema of the eyelids, which often appears at the very beginning, frequently aids in diagnosing a case of *Trichinosis*. In only severe cases does the trichina spiralis emigrate into the external eye muscles.

Cataract and retinal hemorrhages are the most usual ocular complications of *Diabetes*. Less often we may find retinitis, optic neuritis, retrobulbar neuritis, iritis, ocular paralyses, and broken down vitreous conditions.

Rheumatism may be ascribed as the cause of some cases of iritis and iridocyclitis.

Rickets often causes congenital (Zonular) cataracts, interstitial keratitis and phlyctenular kerato-conjunctivitis.

Scurvy most frequently causes an exophthalmos due to hemorrhage into the orbit. This occurs in about 10% of cases. Subconjunctival and retinal hemorrhages occur at times.

The various ocular symptoms and signs of *Exophthalmic Goitre* (*Graves'* or *Basedow's Disease*) are probably well known to all. Varying degrees of exophthalmos are usually present. Von Graefe's sign (lagging of upper lid when looking down), Dalrymple's sign (abnormal widening of palpebral aperture), Stellwag's sign (diminution in power of normal involuntary winking), Moebius' sign (imperfect power of convergence), Gifford's sign (difficulty in everting upper lid), are all due to and produced by the exophthalmos. The cornea may suffer when the exophthalmos is extreme, and epiphora is common.

Space and time forbid me to discuss the effects of many drugs and poisons on the eye. *Quinine* in large doses, or occasionally with moderate doses in susceptible individuals, may produce more or less complete blindness, often noticed suddenly, contracted visual fields, dilated pupils, and marked pallor of the disc,

XUM

with extreme contraction of the retinal vessels.

Since the so-called prohibition went into effect *methyl-alcohol amblyopia or amaurosis*, resulting from the drinking of cheap whiskeys, "moonshine," "hootch," "monkey-rum," "corn," cordials, essences, and other alcoholic beverages, is quite frequently seen and read in the daily papers. Wood alcohol is a protoplasmic poison, possessing a selective affinity for the delicate nerve tissues of the eye. Sudden blindness with vomiting and abdominal pain should arouse suspicion of methyl poisoning; especially if diplopia or ptosis are associated. The ophthalmoscopic appearances are hyperaemia of disc with blurring of edges and later atrophy of the optic nerve with small retinal vessels.

Diseases of the *Accessory Sinuses* (*maxillary*, *ethmoid*, *sphenoid* and *frontal*) are frequently responsible for many ocular symptoms and diseases, among which are orbital cellulitis, exophthalmos, paralyses of ocular muscles, asthenopia, reduction in acuteness of vision, changes in fields of vision, optic neuritis, retrobulbar neuritis, atrophy of optic nerve, corneal ulcers, keratitis and iritis.

The "*innocent*" *faucial tonsils* frequently produce ocular troubles, especially conjunctivitis, keratitis and iritis.

Bad teeth are frequently responsible for much ocular pathology, especially keratitis, corneal ulcers and iritis. The subject of accessory sinus diseases, tonsils and teeth as factors in eye pathology would require a paper alone and our time only permits mentioning them.

In this paper, I have by no means covered the relationship of the eye to all general diseases, but I have tried to select the most usual ones met with in the practice of general medicine.

PLANNING A HOSPITAL IN A CHINESE CITY.*

By CLAUDE M. LEE, M. D., St. Andrew's Hospital, Wusih, China.

There are many here today who remember the difficulties encountered in founding and carrying on the University Hospital. Picture to yourselves these difficulties, plus those which are added to such an enterprise by its being undertaken in a distant land, the work to be done through the medium of a strange tongue. Stand by my operating table with me and hear me say: "*Tau. Yeu ngo-ts kuh kyien. Pih zeh kuh makkwen kyien. Bing li-hyang kuh sien, ih au.*" Which means: "Knife. Toothed forceps. Straight clamps. Plain catgut, No. 1." Think of the agony of wanting these things and forgetting their names in Chinese. And think of the time it took before these orders came out as easily in Chinese as in English.

Having got you into what is, I hope, a sympathetic frame of mind, I am now going to tell you where St. Andrew's Hospital is. It is in Wusih. Wusih is a cocoon raising centre, with large manufacturing interests, situated on the Shanghai-Nanking Railway about half way between these well known cities.

The country around Wusih is an alluvial plain, intersected by very numerous canals. The canals are so close together that on the narrow foot paths between the fields, bridges occur several to the mile. These canals are the roads of this part of China and all are tributaries of the Grand Canal of China, one of the world's most famous waterways. This abundant water supply is vital to the farmers. Rice fields lie between the mulberry groves and these two divide the countryside with the last resting places of the mortal remains of those Chinese who have passed on. The striking features of the landscape, then, are the flat rice fields, green and damp looking; the stunted mulberry trees which are cut back each summer to get the leaves for feeding the silk worms; the canals which are at once the roads, the water works, and the sewers of the populace; and the nodular grave-mounds, which must never be disturbed.

The city of Wusih stands surrounded by a ring of factory chimneys. There are silk mills, cotton mills, flour mills and oil mills, the latter the most deadly of all to the hands of the laborers. The machinery in all these mills is of foreign make, the laborers are men, women, and children. There are no child labor laws in China and in the silk mills conditions are fearful. The hours are from five a. m. to seven p. m., with half an hour out for eating, or a fourteen hour day. The laborers, most of whom are children, work in rooms full of small vats of warm water in which the cocoons are flung to soften the fibre so that

*Read at the meeting of the Piedmont, (Va.) Medical Society at University, Va., November 25, 1922.

they may be reeled. The children must reach up to put the cocoons into the vats. A man with a split bamboo whip walks up and down between the rows of children to keep them at work. He does not hesitate to use his whip.

If you lump the census figures of Roanoke, Lynchburg, and Charlottesville, you have approximately the population of Wusih. The trading population, or those whose business makes this city their "base," amounts to probably 500,000 people.

The climate is about like that of North Carolina along the coast, damp and hot in summer and damp and cold in winter. Probably twice as much rain falls in our neighborhood as falls annually in Albemarle County. This damp hot climate makes central China an ideal home for tuberculosis, malaria, and hookworm. Venereal diseases are very much on the increase. If the pallid spirochete originated in China—and many scholars think it did so—the people showed a great immunity to their home strain. But after part of the family had taken a tour of the world, lasting for centuries, and returned to China by the seaports, luetic infections took on a new virulence.

The valley of the Yang-Tze River is probably the greatest hot-bed of tuberculosis in the world. There are thousands of deaths each year from pulmonary tuberculosis, and the other forms are very abundant.

The rice fields, stagnant pools, myriads of receptacles for night soil, which is one of the most prized commodities of the land, in fact all fishless water, give harbor to myriads of mosquitoes. Malaria carriers infect the mosquitoes, who in turn help the good parasite on its way. The common type of malaria is quartan, but there are epidemics of tertian and estivo-autumnal fevers which are veritable scourges.

Hookworm infests the intestines of eighty per cent. of the farmers. The primary infection through the skin, a cough with possibly some hemoptysis, a period of indigestion, and in about two weeks anaemia and loss of strength, make a clinical picture very familar to the people of Wusih. They call the disease "The Mulberry Leaf Anaemia" from the fact that it chiefly comes on them in the summer, when heat and moisture have made hookworm larvae very comfortable under the shade of the mulberry groves. Men, women, and children repair to the fields for leaves and, as the ground under the trees is kept aromatic with freshly applied night soil, they all get ankylostomiasis. Massive infections are seen and, owing to the branches of the trees being dragged on the damp ground and then hoisted to the bare back, the characteristic skin lesion is seen there too. We have seen such severe infections that the dyspnoea was bad enough to threaten life.

Epidemics of cholera, diphtheria, meningitis, and malignant malaria are occasionally encountered. In one epidemic of cholera we treated over six hundred cases in a little over a month. More than 2,500 cases of diphtheria have been treated in the out-patient department of St. Andrew's Hospital. An epidemic of cerebrospinal meningitis ran to about 120 cases before it stopped itself. We estimate that there were nearly a thousand deaths from malignant malaria year before last in the district around Wusih. About forty per cent. of all the inhabitants of China have trachoma.

Surgery in China does not differ very much from surgery in any other new territory. There are numbers of neglected cases, which are more common, possibly, than in this country where modern surgery has been available for years. At St. Andrew's we try anything that comes along and are amazed at how many specialties we can invade with fairly good results.

But we must get along to the actual starting point of this hospital. The out-patient department was opened in March, 1908. The first year's work saw us take care of 27,500 visits from patients, out-calls, etc. There was a small operating room in the building we had put up for this out-patient work and I well remember the first operation in it. We were engaged in taking off a small epithelioma from an old gentleman's eyelid when he suddenly went bad from the anaesthetic. I doubt if any of you can appreciate the horror of that moment. Like the man in the medical school who was asked what he would do in a certain emergency, I certainly did want to send for a doctor; but there was not one in town at the moment. However, the old man came around and all was well.

Our first in-patients were kept on boats on the canal in front of the dispensary. One or two cataracts were sucessfully done, the patients being obliged to disembark for dressings and inspection of the eyes. Boats are not a

good way to house surgical cases, however. They really leave much to be desired as hospitals when they are only twelve or fourteen feet long and have a whole family aboard, as well as the sick one.

There was one woman cared for who had lost her scalp. She was standing on the deck of her boat using bad language at a fellow boatman, when an anchor swung at a big boat's bow caught her on the forehead with one of its flukes. The scalp peeled back much like the skin of a very ripe peach does when a thumb is judiciously pressed upon it. Her scalp, completely torn off, was sutured into place and the boat moored in front of St. Andrew's dispensary. She got along pretty well until the third day when she suddenly tried to jump overboard. It was found that a three month's fetus had been lost and the woman went plumb crazy. Puerperal insanity can not be treated very well on a small boat.

Then five beds were put in a Chinese house centuries old and we felt that we had arrived. We had a hospital on land. In spite of considerable pride in this achievement, we kept going until we got a larger house also of Chinese construction, into which we put twenty beds. Our next step forward gave us a very nice building of foreign construction, of a capacity of fifty-five beds. In the last year we built an operating room which compares in convenience and sanitary conditions very favorably with the average in this country. We have a series of rooms consisting of anaesthetic, scrub room, sterilizing room, and operating room, all with steam heat and with running hot and cold water laid on. Across a corridor in this building are the offices and X-ray department. All the wards, the offices, the furnace room, and the various departments and residences are connected by telephone. We have our own private exchange. For out-calls two motor boats are kept in commission. Where there are no roads a motor boat is the equivalent of an automobile. The water supply is owned by the hospital and consists of an artesian well and pumping plant. The well supplies us with 8,000 gallons in twenty-four hours, though at present we are using only a fourth of that amount. The water is pumped to a tower and distributed to the different buildings by gravity.

There are five residences in connection with the hospital for the staff, besides buildings for the servants, laundry, and stores. The staff consists of two foreign doctors and four Chinese doctors, two foreign trained nurses and fifteen Chinese graduate and pupil nurses, a chaplain and a foreign social service worker, as well as numerous attendants. The outpatient department maintains a branch dispensary about two miles away in a populous mill district which is a new and growing part of the town. Daily clinics are held in the outpatient department. There is one free day each week which is much appreciated, for there were nearly 10,000 visits to this clinic last year.

The mere recital of physical equipment does not give any idea of the intense human interest in a venture of this kind. Cut off from professional association in large measure, and without the possibility of consultation, there is a great strain to be borne always—first, a strain from responsibility, and second, a strain on the conscience, to keep a man from letting down on asepsis, and on good careful work.

There are adventures from time to time which enliven things. Let me pause to classify some of them and give examples of each kind. There are social, physical, and professional adventures. In a social way things in China are very different from things over here. Have you ever heard of the ancient eggs of Chinese feasts? A young man went out to Wusih from Charlottesville. He was invited to a feast, given by some Chinese gentlemen. Buried eggs which had been recovered as the result of excavations were served. These eggs are buried in lime and when exhumed the meat has a distinctly cyanotic color. Chinese officials of the old regime used to let their nails grow long to show they never had done any manual labor. One old gentleman at this feast had a long black claw on his little finger which had on its under surface a specimen of everything he had ever eaten since childhood. He sliced a bit of egg with this nail. He speared the slice with that same horrid nail and offered it to the pale young American. That young hero, this is not a personal narrative, though I know it to be true, took the egg and ate it all. It stayed down. This young man never got the medal his conduct deserved.

For obvious reasons one does not give personal narratives of physical adventure. But I knew a man in China who had all his clothes

taken away from him by rapacious bandits when he was miles from home and blown upon by an icy night wind in mid-winter.

It is something of a professional adventure to have a patient for whom you are harmlessly changing a surgical dressing expire, when you are a long way from your friends and surrounded by his friends. Yet, I know a man to whom this happened. He was dressing a carbuncle, which was doing beautifully, but the patient suddenly died. The Greeks had a pleasant custom under certain circumstances of chaining a living man to a corpse. Just exactly this procedure was proposed, the great doors of the Chinese house were shut and clamor arose and horrible pandemonium. The doctor escaped, but he was thoroughly frightened. It is an interesting thing to work in a Chinese city.

In closing, I am going to ask a question. What is to be the fate of a foreign hospital in a Chinese city? We hope that St. Andrew's Hospital will ultimately become the City Hospital of Wusih—under Chinese management entirely and under Christian management, if possible. With the return of numerous students of medicine from abroad, with the graduation of still more numerous students from real medical schools in China, it seems to me that ten or twenty years will see mission hospitals largely turned over to the Chinese and the work taken out of foreign hands.

PHLYCTENULAR KERATO-CONJUNCTIVITIS.

By SIDNEY TRATTNER, M. D., Richmond, Va.

This paper is a review of the literature on phlyctenular kerato-conjunctivitis, with regard to etiology only. It might seem that this is a timeworn subject, but it is surprising to see how little has been written on this condition in the past few years. What is still more surprising is that in spite of excellent authority and emphatic statements in favor of one theory of causation or another, the etiology is still a matter of dispute. Men whose opinion is to be respected, are ranged for and against every factor indicated, and it was this that suggested that a review of these opinions might show where the greatest weight of authority rested.

To indicate what conflicting views there are as to the origin of this condition, the following list will be of interest. At various times these causes have been assigned to phlyctenule: Exposure to wind, dust, bad living conditions, anemia, poor health, intestinal derangements, pediculosis, errors of refraction, auto-intoxication, eczema, various bacteria, scrofula, the exudative diathesis, tonsil and adenoid conditions, nasal conditions, herpes, anaphylaxis, and a derangement of carbohydrate metabolism.

Of these, tuberculosis, the exudative diathesis, eczema, scrofula and faulty digestion and metabolism have received the most attention. Probably the earliest observations were those which noted the frequent occurrence of phlyctenule with the condition known as scrofula. The name conjunctivitis externa scrofulosa was given it as long ago as 1813, by Beer. Later investigators agreed with this, although Mackenzie in 1833, while regarding the scrofulous condition as being the chief predisposing factor, thought that remote causes operated in the production of the disease.

Since then opinions have been conflicting, and the long list of causes ascribed to phlyctenule is evidence of how obscure the basis of this condition is. However, these divergent views may be roughly classified into two groups for the purposes of this paper: the first, those which ascribe the cause to tuberculosis, and the second, those which ascribe it to other factors.

Considering first the non-tuberculous theories that have been discussed in the literature since 1910, we meet with the following:

Colombo in 1911, did some work with the object of proving that phlyctenule was the result of gastro-intestinal disturbance. His method was to determine the amount of indicanuria in his cases, and he found that in one series forty-two out of forty-three had indican. A later series showed somewhat the same findings. However, it was afterwards shown by von Hippel and others that in phlyctenular disease indicanuria was no more frequent than in other eye conditions, or for that matter in conditions elsewhere in the body. More recent experiments in metabolism have shown that the degree of indicanuria is no gauge of intestinal toxemia. However, other observers have noted that gastro-intestinal disturbances are by no means a constant factor in cases of phlyctenular ophthalmia. In ninety-two cases

*Read at the November meeting of the Richmond Society of Ophthalmology and Oto-Laryngology.

XUM

studied, W. S. Gibson found only nineteen in which there was any evidence of derangement of the gastro-intestinal tract.

Will Walter (*J. A. M. A.* Sept. 1913) wrote that the theory of bacterial infection was not proven; that the malnutrition and auto-intoxication theory was important and fundamental; but that neither of these factors was the specific cause. He stated that the endogenous infection theory considered latent tuberculosis as the most probable cause, and concluded by saying that the part played by a possible anaphylaxis was to be considered.

Another adherent to the auto-intoxication theory was H. D. Bruns, who in 1912 stated that he believed the condition to be a neuropathic one, depending on auto-intoxication and gastro-intestinal disturbances.

In a later discussion Bruns said that he favored a neuropathic origin following some shock, disturbance of metabolism or gastro-intestinal disturbance. He likened the lesions to herpes and stated that they occurred in the nerve-ends. He quoted I. Dyer, a pathologist, to the same effect.

Samuel Theobald (*A. M. A.* Aug. 1914) stated that the evidence in support of a tuberculosis or pseudo-tuberculosis origin was far from convincing. The almost constant association of facial eczema with the ocular inflammation showed that it was an ocular eczema.

Hunter H. Turner, discussing the question in 1917, said that faulty carbohydrate metabolism could not explain the variations in phlyctenulosis. He thought the condition due to a chronic low-grade ethmoiditis with obstruction to drainage.

M. Goldenburg, in the Section on Ophthalmology 1917, read a paper in which his conclusions were as follows:

1. Ophthalmia eczematosa, or phlyctenular disease, is not a true pathologic entity, but a symptomatic manifestation of a systematic disturbance.

2. Tuberculosis, syphilis and sepsis can be excluded with certainty as causal factors.

3. Phlyctenular disease is in all probability one of the expressions of a vagus system irritability produced by some toxic agent resulting from carbohydrate chemism.

4. Correction of the chemism by a carbohydrate-free diet and control of the vagus hypertonia through the topical and internal use of atropine yield the best and quickest possible therapeutic results.

These conclusions were arrived at as the result of the study of five hundred cases covering a period of seven years.

Duane, in his translation of Fuchs, writes, "In any event it seems clear that the relationship of this disease to tuberculosis is at most an indirect one. The results of treatment point to some other contributory or perhaps essential cause (disturbance of metabolism due to gastro-intestinal toxemia, pharyngeal and tonsillar infection, etc." Further on he writes, "Sweets, especially candy, cakes, pies and pastry of all kinds should be forbidden, and only very plain but substantial food allowed. It would seem that regulation of the diet alone may do a great deal toward effecting a cure in these cases."

A number of writers on the subject are neither for or against tuberculosis, but include it as one of a variety of causes.

Lafon divided the cases into three classes etiologically:

1. Tuberculous.
2. Following the exanthemata.
3. Gastro-intestinal and naso-pharyngeal.

Schuetz and Videky classified according to therapeutic results and found two groups:

1. Tuberculous, and cured by tuberculin.
2. Exudative, and cured by a diet free from sugar and eggs, and with little meat.

Oskar Everbush in his text-book on Diseases of the Eye in Childhood says: "Particularly are children of the scrofulo-lymphatic habitus attacked by conjunctivitis phlyctenulosa.

"Catarrhal conjunctivitis, the acute exanthemata, skin eruptions such as eczema, intertrigo, prurigo, urticaria, various forms of blepharitis, eczematous eruptions of the skin of the face, pediculosis capitis, and general uncleanliness are etiologically of significance. In phlyctena in non-tuberculous children 'Lymphatism,' 'Oxypathy,' or the 'Exudative Diathesis' following a diet with excess of fat producing foods or an intestinal auto-intoxication, are the bases, following which the tissues of the conjunctiva and cornea of these children are strongly susceptible to infection through their great sensitivity to bacterial proteins, particularly when resistance has been lessened as the result of a previous tuberculous infection."

Roemer in his Greifswald lectures published in 1913, says: "Although a certain connection exists, scrofulosis is not necessarily the only cause of kerato-conjunctivitis eczematosa. All scrofulous children do not suffer from this disease, and, on the other hand, we meet with cases in which positive signs of scrofulosis cannot be demonstrated, even though it cannot be excluded. . . . All that we can say as yet is, that in the majority of cases the scrofulous diathesis predisposes to this disease." Discussing the theory of endogenous infection he says, "In the first place no micro-organism yet known to us can be found within the fresh efflorescences on microscopical examination (Axenfeld, Wagenmann, Hertel, L. Mueller and others). Cultures likewise fail to detect ordinary bacteria in these nodes. Dead tubercle bacilli are not to be found in them. In the second place Leber and others have demonstarted that the inoculation of fresh efflorescences into the anterior chamber of rabbits excites no inflammation. In the third place the giant cells occasionally found in the efflorescences are not evidence of a tubercular origin especially as these cells are not of Langerhans' type. The evidence which has been brought forward does not convince me that kerato-conjunctivitis eczematosa is caused by an endogenous infection.

"I maintain on the contrary that an ectogenous origin must be granted before the disease can be understood. . . . The entire clinical picture of kerato-conjunctivitis eczematosa becomes comprehensible at once when we assume that a specific agent as yet unknown, but perhaps widespread, excites the discrete diseases on the surface of the eye, especially in persons with a scrofulous diathesis."

Fuchs in Duane's Sixth Edition states that phlyctenular disease has its origin in the scrofulous diathesis. Discussing the nature of the efflorescence he says that two things have to be kept in mind: "1. The efflorescences when quite recent are sterile, containing neither the ordinary pyogenic germs nor tubercle bacilli. Inoculation from them into a test animal does not lead to tuberculosis. Hence it cannot be assumed that, like other inflammations of the conjunctiva, they are referable to ectogenous infection, and as little are they to be regarded in the light of true tuberculous nodules.

"2. In a great number of patients with conjunctivitis eczematosa there are changes which are certainly tuberculous. . . . But even in those patients who otherwise show no clinically demonstrable evidence of scrofula or tuberculosis the examination with tuberculin . . . proves with rare exceptions the presence of latent tuberculosis. . . . We should not be far out in explaining them (the efflorescences) as being due to the action of toxic substances, in the same way, as for example, nodules develop in tuberculous individuals after the rubbing of a tuberculin ointment into the skin (Moro)."

It will be noted that the only point upon which Fuchs and Roemer agree is the culpability of the scrofulous diathesis.

Everbush speaks of von Hoffman as having "first mentioned the connection between phlyctenular kerato-conjunctivitis, persistent eczema and inflammation of the lids, on the one hand, and, on the other, disease of the lacrimal passages, tonsillar disease and concretions, as well as the usefulness of treating the nose and throat in scrofulous children."

When we turn to the tuberculous theory we find a rather long, weighty list of names in support of it. In this connection it might be well to mention that there is no lack of opinion to the effect that scrofulosis always means tuberculosis, and that some who support the scrofulous theory might properly be regarded as supporting the tuberculous. The relation of scrofula and tuberculosis is still in dispute, so that this factor must remain unsettled. Many writers on the subject seem to believe that scrofula is a condition or habitus which predisposes to tuberculosis. A. Czerny, in 1913, in an attempt to straighten out the contradictory observation in this condition, named the predisposing habitus the "exudative diathesis" and taught that it was only when these cases became infected with tuberculosis that the term scrofula was applicable.

R. Hilbert (Sensburg, 1902) found in 100 cases of phlyctena, scrofulous glands in seventy-three, scrofulous eruption in twenty-two, and rachitis in five. He accordingly decided that the association with scrofula was not a coincident.

Leber contended that the phlyctenule was the result of substances from dead tubercle bacilli set free from caseous foci elsewhere in the body. He presented some experimental support. Later he injected dead tubercle bacilli into rabbits with the intention of pro-

XUM

ducing phlyctenules in that way, but had no success in this attempt.

O. Bruns, a pupil of Leber, repeated Leber's experiments with like results. He also tried to produce phlyctena by injecting tubercle bacilli into rabbits, but the result was a true ocular tuberculosis and not phlyctenular disease (*Archiv. f. Ophthal.* 1904).

De Wecker was of the opinion that the condition was due to the toxin of the tubercle bacillus and thought that the phlyctenules were analogous to tuberculides of the skin.

Turien, writing in 1911, stated that "1. The tuberculous nature of conjunctivitis eczematosa is established and this opinion is supported by the results obtained in cases subjected to tuberculin both diagnostically and therapeutically, and by the majority of other essential findings. 2. The cutaneous diagnostic test of von Pirquet is a dependable method for recognizing tuberculosis, particularly in children. 3. Tuberculin as a therapeutic agent in the treatment of conjunctivitis eczematosa is an agent of distinct and special value."

The von Pirquet test and reactions following the use of tuberculin diagnostically and therapeutically figure largely in the attempts to establish the tuberculous etiology. Apparently few writers who oppose the tuberculous theory seem able to explain away these reactions. The only definite statement of that nature which I have seen is one by Geo. S. Derby, in the *J. A. M. A.* Sept., 1912, and that is a negative one. He said, "I have had considerable experience with tuberculin in the treatment of phlyctenulosis, and I feel doubtful whether any of these cases have been much benefited by it." However, elsewhere he says that though the tuberculosis theory was not proven, evidence showed that the incidence of phlyctenule has a relation to the incidence of tuberculosis.

Regarding the value of the von Pirquet test, statistics are interesting in this connection. In twelve series of cases by eleven investigators, the total number of cases of phlyctenulosis was 903. (Ayrenx, Bednarski, Belenky-Raskins, Bruns, Bywater, Davis and Vaugan, Derby, Pyfer, Rosenhauch, Tivnen, and Weekers.) Of these 769 gave positive tuberculin reactions, which is eighty-five per cent. The claim was then put forward that the percentage of positive reactions would probably be as high in any group of individuals examined. Figures seem to deny this. In three series* investigated by three different men, totaling 1,806 children under six years of age, the percentage of positive von Pirquet reactions was eighteen and eight-tenths per cent. These children were taken at random. Whereas in three series of cases of phlyctena investigated by three different men (Belenky-Raskin, Weekers, Gibson), in a total of 118 children under six years of age, ninety per cent. gave positive reactions. This strongly suggests that there is some connection between phlyctena and a positive tuberculin reaction.

Belenky-Raskin (*Zeitschr. f. Augenheilk.* vol. 29, part 6) subjected 100 cases to the von Pirquet test and to the Moro test; ninety-two per cent. gave a positive von Pirquet and eighty-five per cent. a positive Moro reaction. He was convinced of the tuberculous nature of this disease.

The experimental production of phlyctenules has been reported by a number of men. In 1910 Rosenhauch (*Archiv. f. Ophthal.*) introduced staphylococcus pyogenes aureus into the eyes of tuberculous rabbits and phlyctenular disease resulted. Introducing the staphylococci into the eyes of healthy animals did not produce this result. He also took healthy rabbits and injected them with tuberculin. Into the eyes of one series he introduced staphylococcus pyogenes aureus, and into the eyes of another series, toxin from the same organism. Phlyctena resulted in seventy per cent. of both series. He concluded that phlyctenular disease was the result of the combined action of the toxins of tubercle bacilli and some other organism.

Weekers produced phlyctenules by the instillation of old tuberculin into the conjunctival sac of tuberculous rabbits. He believed the condition due to the toxin of the tubercle bacillus, and did not consider other organisms played any part, as he achieved his results by the use of tuberculin only.

J. Rubert (*Klin. Monatsbl. f. Augenheilk.* Sept., 1912), in addition to the experiments of Rosenhauch and Weekers, tried various modifications of them. His results were somewhat contrary, and he came to the conclusion that phlyctenulosis is the result of metabolic action and that auto-intoxication and the exuda-

*Von Pirquet, Hamburger and Monti, and Veeder and Johnston.

tive diathesis cannot alone be blamed but must be accompanied by tuberculosis.

W. S. Gibson (*Amer. J. Dis. Child.*, Feb., 1918) produced phlyctenules eight times in tuberculous rabbits; six times following the injection of tuberculin into the conjunctival sac, and twice in the absence of any local irritation. He states that numerous attempts to produce the disease in non-tuberculous animals were unsuccessful.

In 1912, Davis and Vaugan reported forty cases in which tuberculin was used diagnostically and therapeutically. They decided that the results indicated the value of tuberculin.

S. Stephenson (*Lancet*, July, 1914) writes that from the similarity of findings of many observers the association between phlyctena and tubercle was proven on biologic and clinical grounds and could not be doubted.

Igersheimer was in favor of the tuberculous origin, but could not get away from the fact that some cases have no suspicion of tuberculosis at all.

F. H. Verhoeff thinks the disease is always due to tuberculosis clinically and by tuberculin tests. He believes the phlyctenule is an anaphylactic reaction and that the reason that some cases do not react to tuberculin is that they are at the time in a refractory state. A later test might prove positive in these instances.

A. C. Norman (*Hospital*, London, 1915) remarked that "Under tuberculin treatment the process of ulceration was arrested very much more quickly than by ordinary methods alone, and the resulting area of corneal opacity was correspondingly diminished. Another advantage is a remarkable freedom from relapse, but to insure this we find it necessary to give the full course of fourteen injections in all cases."

J. H. Elliot (*Trans. Nat. Assoc. for the Study and Prevent. of Tuberculosis*, 1916) says that "it has been our experience that every child that has phlyctena has given a tubercular reaction."

R. Tivnen, as the result of the study of fifty cases treated with tuberculin, 1917, believes the disease due to tuberculosis.

L. J. Goldbach (Sect. on Opthal. 1917) sums up a report on the study of thirty-nine cases by saying "I am not claiming this manifestation as a certainty of tuberculosis, but that in a majority of cases, if we use all methods of diagnosis we will find some evidence of symptoms that go with tuberculosis."

W. S. Gibson (*Am. J. Dis. Child.*, Feb., 1918), in the summary of a comprehensive article, says "Clinical observation on ninety-two cases of phlyctenular conjunctivitis revealed the presence of tuberculosis in ninety cases, as shown by a positive von Pirquet test. In the two giving a negative reaction the diagnosis was doubtful. No other condition, either local or general, could be found with sufficient frequency even to suggest any direct influence in producing the disease."

In a discussion following papers on phlyctenular disease before the Section on Ophthalmology, in 1917, H. W. Woodruff spoke against the tendency of trying to make one factor responsible for the production of this condition. He thought it was the result of a combination.

In summing up the evidence presented in the literature reviewed here, we find: In favor of:

Auto-Intoxication	2 men
Carbo-Hydrate metabolism disturbance	1 man
Eczema	1 man
Ethmoiditis	1 man
Ectogenous Infection	1 man
Scrofula	4 men
Tuberculosis	15 men
Tuberculosis, with reservations	4 men
Undecided	1 man
Variety of causes (any of a)	7 men

In addition to this two men enumerated above, while favoring some specific cause, believe that the condition may be an anaphylactic reaction. Many that give a multiple etiology include tuberculosis in their list.

Regarding the question from the standpoint of sheer numbers, it would seem to be settled beyond doubt in favor of tuberculosis. From the standpoint of authority and weight of argument, it is not as obviously decided in favor of tuberculosis as it might seem. This is a decision that cannot be presented in mathematical terms but must be left for the reason and judgment of the reader. The impression gained in reviewing the literature was that the tubercle bacillus was the most probable etiological factor discussed.

114 *North Fifth Street.*

XUM

AFTER CARE OF OBSTETRIC PATIENTS.*

By C. J. ANDREWS, M. D., F. A. C. S., Norfolk, Virginia.

A consideration of the after care of obstetrical patients leads us to consider at least the principal pathological conditions which may follow labor. Examination at the time of discharge will be expected to show the degree of injury to the perineum, cervix, uterine supports—evidence of subinvolution, infection of cervix, uterus, or adnexa, and mal-position, as well as general condition of patient.

The frequency of these conditions will depend to a large extent upon the degree of success with which the pregnancy, labor and puerperium have been conducted, but so far we know of no way of preventing these in all cases, and until we do this, we know that a certain number will have some of these conditions. Therefore, it seems difficult to avoid the conclusion that all cases should be examined before discharge, in order that the abnormal condition may be discovered, and suitable advice given.

My records of 200 discharge examinations, made from six weeks to three months after labor, showed that in 21 cases the perineum was in an unsatisfactory condition. About sixteen of this group were multiparae, with previous injuries; one a primipara, who had a rapid, easy labor, with only a mucous membrane tear. Two others had induced labor, and forceps for threatened eclampsia.

Recently, I have used the Potter method of ironing the perineum with considerable satisfaction, and only occasionally used the episiotomy. In the first 150 cases, episiotomy was used rather often in primiparae with good results. Practically all were delivered under deep anesthesia.

Primary repair of the perineum has been usually very satisfactory, but occasionally the stitches will break down. In a few such cases I have done a secondary repair after about ten days, while the patient was still in the hospital. The results have been good, except in one case the perineum was closed somewhat too effectually. In those cases which require operation later, they are advised of this fact, usually after the nursing period is completed.

The unhealed, infected cervix laceration is of great importance to the patient's future health. It is the beginning of endocervicitis, which forms a focus of infection which may destroy the woman's health. Examination of the cervix, particularly, has a secondary function—that of testing the relative merits of vaious methods of delivery.

My observation has led me to believe that forceps delivery, with the head still in the cervix, has given the greatest number of injuries. Properly performed version gives less. Forcible delivery by any method when the cervix is not fully dilated is usually very difficult, and the cervix is exposed to considerable trauma, and often badly torn.

My records show that 17 in 200, or 8½%, private patients had evidence of cervical infection at time of discharge. Some of these more superficial erosions are improved by silver nitrate or iodine, or other local applications. If the cervical glands are infected this will do no good. An electric cautery, such as is used for nose and throat treatment is most effectual. This method was described by Dickenson in the *American Journal of Obstetrics and Gynecology* during the past year. The small point is carried into the crypt, actually destroying it. If the eroded surface is broad, the blade makes one or two cuts in each lip of the cervix. The cautery is not heated to a very high degree, and has somewhat the effect of the Percy cold iron treatment. The slough separates in one or two weeks, and the surface heals with considerable rapidity.

My experience with this has been largely with old cases. One cystic cervix, which had followed labor nine years before, healed satisfactorily with this treatment. Some of these cases will require surgical treatment later. Where there was a well established endocervicitis, the Sterndorf operation has been very satisfactory, although the Schroeder, or some modification of it, has been used in a number of cases with satisfaction.

Retrodisplacement of the uterus seems to be very frequent. Many observers agree that it exists in about 22% of all women examined. E. Schroeder, 1900, reported 28.7 retroversions in 411 gynecological cases. Only a few have investigated the frequency of uterine displacement after labor. Winter found that they occurred in 12% of 300 women from two to ten months after labor. Lynch, 1922, reports 41.1 in 505 clinic cases; and in 19.6 of 186 private

*Read before the Norfolk County Medical Society November 27th, 1922.

cases examined from six to eight months after labor.

My own records show 27 retrodisplacements in 200 private cases, or 13.5%. In my own cases I do not know how many were present before pregnancy but I think only about four were of the type which is usually congenital. It we were to double this to provide a margin, and say that 4% of all cases existed befor labor, it would still leave 18% as due to labor. I hope that our hospital records may soon be available to give us additional information on these subjects.

If we admit the approximate accuracy of this, and also that the retrodisplacement is a considerable factor in pelvic diseases, we still have to agree that the discharge examination for the purpose of discovering these conditions, and applying suitable relief, is a necessity. Fortunately, the relief of retroversion after labor seems to be comparatively easy. With the exception of the cases which have had some inflammatory condition, simple office treatment will leave the percentage about the same as in the nulliparous, and some of these will be benefited by suitable operation.

Face position, knee chest position observation of patient as to progress of involution before allowing out of bed, have all been used to prevent retrodisplacement. The kangaroo walk as recommended by Polak has not yet been tried.

Pelvic inflammation of any kind favors retrodisplacement. Laceration of perineum does not appear to affect it. Stretching of the round ligaments during pregnancy, together with injury of the cardinal ligaments during delivery, promotes retrodisplacement. When the uterus is found to be retrodisplaced after labor, it is replaced manually by the aid of a tenaculum on the cervix. Gentle traction is made until the fundus is released, then the tenaculum is held by an assistant and, with two fingers in the vagina behind the cervix, the fundus is lifted forward. At this moment the assistant carries the cervix forward and downward, while the left hand on the abdomen catches the fundus and brings it forward. In some cases the uterus is left without any further treatment. If it remains in position, nothing further is needed, but if the retrodisplacement has recurred when the patient returns a week later, a pessary is used. This is changed once in thirty days. Usually after about two months, in uncomplicated cases, the fundus remains in normal position. If adhesions are present the pessary will be of no use.

Twenty-two of my 27 cases of retrodisplacement after labor were in position when last examined. These patients can often tell when the uterus is out of position. The pessary gives information as to the relation of the symptoms which the woman may have due to retrodisplacement. If the symptoms are relieved, it is very good evidence that they are due to the displacement. If the retrodisplacement persists, and there is later evidence that it is interfering with health, some operation for retrodisplacement is done. I have used a considerable number, but have had most satisfactory results from a modification of the internal Alexander, which brings the round ligament to the under surface of the fascia near the internal ring.

The Johnston-Willis modification of the Coffey operation is extremely satisfactory, but the use of non-absorbable suture in the abdomen is not entirely satisfactory, and therefore we are not using that at present.

Does retrodisplacement of the uterus give symptoms? E. Schroeder in 1900, examined 411 women. Seventy-three per cent, or 303, had no pelvic symptoms, yet 26%, or 79, of these had retroversion. There were 108 women who complained of lower abdominal symptoms. Thirty-six per cent, or 39 cases, had retrodisplacement. He concludes that 25% of women who complain of no symptoms referable to the pelvic organs have retrodisplacement.

A recent study, 1922, by Lynch, showed that in a series of 505 cases of retrodisplacement, 32% complained of bearing down sensations, pressure in the pelvis, and backache; while only 10% of 725 normal cases complained of these symptoms. In other words, he found pelvic symptoms three times as frequent with retrodisplaced uteri as in normal cases. Apparently, the observations as to symptoms from retrodisplacement have been largely centered on local symptoms. Probably the effect on the patient's general condition is often as important. Although it is admitted that 22% is approximately a correct estimate for the incidence of retrodisplacement in cases examined, this does not mean that 22% of all women have retrodisplacement of the uterus.

XUM

When one considers that a woman is not likely to have a pelvic examination unless she has some pelvic symptoms, it seems reasonable to conclude that 22% who have symptoms referable to the pelvis have retroverted uterus. This would certainly seem to show that retrodisplacement was a factor of considerable importance in pelvic diseases.

Potential prolapse, cystocele, and rectocele cases are kept under observation until the nursing period has passed, when suitable treatment may be instituted. It seems particularly important that patients be told very plainly of the prospects if these conditions are not treated. The problem of the prolapsed uterus would be largely solved if this course could be always pursued.

512 *Taylor Building.*

THE DIAGNOSIS OF TUBERCULOSIS IN CHILDHOOD.*

By FRANK B. STAFFORD, M. D., Blue Ridge Sanatorium, Charlottesville, Va.

In recent years the diagnosis of pulmonary tuberculosis in adults has been placed on a fairly satisfactory basis. Dr. Lawrason Brown[1] has by formulating his five diagnostic postulates, given a valuable contribution to this work and placed it at the disposal of the entire profession. Briefly, they are as follows:

(1). Definite physical findings above the second rib in front and the third vertebral spine behind.
(2). Blood spitting.
(3). Pleurisy with effusion.
(4). Parenchymatous X-ray lesions in an apex.
(5). And most important, the presence of tubercle bacilli in the sputum.

When we come to consider the diagnosis of tuberculosis in childhood there is quite a different situation confronting us. Little has been said or written that is really helpful. All have been satisfied to pass up the situation as most difficult without seeking to learn something of its various aspects. There is today a growing demand for a more thorough analysis and diagnosis of childhood cases, and any information or discussion of the problem must be helpful. It is quite obvious that the diagnosis must be made early and the proper treatment instituted at once if the prognosis is to be good. This has long since been proven true in adult tuberculosis. Surely, it would apply more to the growing child that has the disease.

There is not a single diseased condition that requires more careful study of all the available data on the part of the clinician than childhood tuberculosis. Short cuts, clues, easy signs and clear markings of the disease are conspicuous by their absence. Time must be given; the case must be studied from every available angle; the data must be carefully correlated and digested before a final verdict can be rendered. Symptoms will invariably be more pronounced than physical signs. Other factors which will greatly aid in the diagnosis and must be considered are X-ray findings and the cutaneous tuberculin test.

Before taking up each of these separately it might be well to devote a little time to the discussion of what constitutes a normal chest in childhood. A committee[2] appointed by the National Tuberculosis Association to study the normal chests of five hundred children between the ages of 6 and 10 years reported their findings to the Association at the last meeting in Washington. The committee studied the chests from both, the standpoint of the physical signs and X-ray findings, and reported many variations in each that were still well within the limits of normal. They found the percussion note elicited over the normal chest to be fuller, more tympanitic and higher pitched; while the breath sounds varied from puerile, where the expiration was prolonged and higher pitched, to the normal type heard in adults. The X-ray findings were at such variance that it was decided to divide the chest into three zones from within outward, and deal with the shadows cast according to their location in the zones.

Tuberculous infection, considered now to be almost universal, is quite different from open, active, clinical disease. The infection may remain well under control and never give trouble if the child is kept strong and healthy, while on the other hand some exciting factor is apt to break down the resistance and sickness is the result with definite signs and symptoms. It is this form producing definite signs and symptoms and ranging from a tracheo-bronchial lymph adenitis to a localization in the hila regions, occurring in children between the ages of six and twelve or fourteen years, in which we are most interested.

*Read at the meeting of the Piedmont Medical Society in Charlottesville, November 25, 1922.

History: The history is perhaps the most important piece of evidence at our command and is often the chief reliance in determining the real nature of the trouble. This, however, is not always easily obtainable; the child will have very little knowledge of past events and we must rely on the parents for this information. To consider the onset of the disease gradual and usually pursuing a chronic course in childhood, we can better understand why much time should be given to collecting all the positive facts connected with a complete history. Living conditions in the home should be investigated. A history of repeated contact, or prolonged exposure to the disease, whether in the home or outside of it, is of great importance. For one of the parents to be suffering from the disease, or a grandmother or aunt living in the home to have an old chronic fibroid lesion, it would make one search more carefully. It is also important to know that the milk supply in the home comes from a tuberculin tested herd. The child may get infected from this source. The German Commission[3] appointed to investigate the danger to human health from drinking milk from infected cows reported one-fourth of the children examined to be tuberculous. The English Commission serving the same function reported one-half of the children having tuberculosis of the digestive tract to be due to bovine type. These reports seem to be rather high, probably due to the fact that the European cattle have a higher percentage of infection than the American. This is sufficient to say that bovine tuberculosis is now a reality and not a fancy. It should be remembered, however, that even though you are not able to get a history of exposure to tuberculosis, child is not tuberculous. On the other hand, either human or bovine, is no proof that the if such information can be obtained with definite clinical evidence, corroborated by X-ray findings, the diagnosis is well established.

Symptoms: Certain local symptoms, such as cough, expectoration, hemoptysis and pleurisy, are important when they exist; but, where the lesion is well localized in the glands in the hila regions, all are apt to be absent unless it is a slight cough. Constitutional manifestations, such as afternoon rise in temperature, increased pulse rate, poor appetite, languor, loss of strength, fatigue, or lack of endurance, and failure to gain weight, should be carefully noted. A stationary weight in a child is equivalent to the loss of weight in an adult. Any child who fails to gain weight over a period of from three to six months is suspicious and should make one think of pulmonary disease. Of all the symptoms that a tuberculous child may have, failure to gain weight, irregular and "finicky" appetite, and fatigue on exertion, are probably the most important. On returning from school in the afternoon the child prefers to lie around, has no energy, and is tired all the time. There is a distinct lack of "pep" which is so manifest in growing, healthy children. Susceptibility to colds is another important factor and when present should be carefully noted.

Physical Signs: The examination of the chest in this type of the disease is usually not worth much. The situation of the lesion makes it difficult to detect any abnormal condition. If the examiner has a full appreciation of the wide range the normal may present, less erring is apt to take place. Also, the younger the child, the more exaggerated are the normal findings. D'Espines's sign once thought to be indicative of enlarged glands in the hilum region is now known to be of little value. Dullness in the para-sternal and para-vertebral regions is to be relied on only when supported by the X-ray. A hilum dimple is of some diagnostic value when it exists. The breath sounds may be harsher, higher pitched, and have the expiration more prolonged than the normal puerile breathing heard in the hila regions. Palpable glands in the cervical and submaxillary regions are of no special significance unless superficially located, matted together, and they have a tendency to necrosis. Infected tonsils and carious teeth can cause enlarged glands in these regions. The chest should be examined for rales heard during inspiration following expiration and cough; but this, like hemoptysis and tubercle bacilli in the sputum, will not occur unless the disease has spread beyond the hilum into the parenchyma of the lung, or a caseous nodule has ruptured into a bronchus.

X-ray: No examination of the child's chest is complete until stereoscopic X-ray plates have been taken and carefully interpreted by one experienced in this line of work. "Visionary interpretations"[4] of the plates spoken of by Osler may occur if the internist attempts to read them. Especially is this true if on the

physical examination evidences of hilum involvement have been found and he is overanxious to confirm it by the X-ray. Skill and good technique are necessary in making the picture, since it is hard to keep children quiet and have them hold their breath during the exposure. This adjunct like the physical has been found to show many variations from the normal. After-effects of certain diseases, such as deep colds, grippe, bronchitis, infected tonsils, measles and whooping cough, may cause increased hila shadows and thickening of the bronchial trunks not unlike a tracheo-bronchial tuberculosis. The expert in this particular field usually has certain differential points that guide him and prevent misinterpretations.

Tuberculin Test: In regard to this point the same applies as to others entering into the diagnosis. There is a wide difference of opinion. Some have even gone so far as to say the diagnosis of tuberculosis in any form is incomplete unless supported by a positive tuberculin reaction. This is indeed, putting it too strong and we may expect much damage to the patient by its careless use. Especially is this true if administered subcutaneously. The cutaneous test of von Pirquet is the one most frequently used in children. This method is simple, harmless and easily applied. When positive, it only indicates the presence of a tuberculous infection and not necessarily a diseased condition. Too much importance must not be placed on a positive cutaneous test where there is no indication of sickness. On the other hand, if a child has a suggestive history with definite symptoms and signs, and the von Pirquet test is positive, the burden of proof is in favor of active, clinical disease. Certain conditions will alter this reaction. In advanced tuberculosis where the resistance is broken down and in some of the acute infectious diseases like measles the test may be negative. Of the 63 children admitted to Blue Ridge Sanatorium in the last few months, 55 have given a positive von Pirquet test. In most of these cases there was clinical evidence of disease and a positive diagnosis made. Of the eight that were negative, two were in the terminal stages of the disease with tubercle bacilli in the sputum, running temperature, and died soon after discharge. In the remaining six who were repeatedly negative there was no evidence of the disease and we were unable to make a diagnosis.

In the diagnosis of childhood tuberculosis, many other conditions not discussed here must be taken into consideration. Intestinal parasites, bad teeth, infected tonsils and adenoids, and the various physical defects may upset a bodily balance and be stepping stones to active disease. Again, these conditions may cause the disease to be masked in its incipiency and the proper diagnosis postponed until it is too late to effect a *cure*. Many children are today dying of pneumonia and chronic dysenteries who have tuberculosis as their background.

Summary.

1. To diagnose tuberculosis in childhood is to strike at the very root of the disease; to give the patient a chance to take the treatment early; and ultimately offer a better chance for recovery.

2. There is a much higher incidence of active tuberculosis in childhood than is generally thought.

3. In considering the normal chest of a child, many variations have been found from both the standpoint of physical signs and X-ray findings that are to be considered normal.

4. The diagnois of hilus tuberculosis requires much time and a thorough analysis of four points:

(a). Complete history, including symptoms.
(b). Physical examination.
(c). Stereoscopic X-ray plates.
(d). Cutaneous tuberculin test.

All of these points are important but the outstanding factors are complete history with symptoms and X-ray.

References.

(1) Lawrason Brown: *Certain Fundamentals in Early Diagnosis of Pulmonary Tuberculosis.* Journal A. M. A. January 14, 1922.
(2) Committee appointed by National T. B. Assn.: *Clinical and X-Ray Findings in Chests of Normal Children.* Jour. Amer. Review of Tuberculosis, July, 1922.
(3) Mazyck P. Ravenel. Illinois Health Bulletin, May, 1922.
(4) Norris and Landis. *Diseases of the Chest.* Page 357.

A REAL MAN

The test of a man is the fight he makes,
The grit that he daily shows;
The way he stands on his feet and takes
Fate's numerous bumps and blows.
A coward can smile when there's naught to fear,
When nothing his progress bars,
But it takes a man to stand up and cheer
While some other fellow stars.

—*Selected.*

NEWER METHODS OF DETERMINING CONDITION OF NUTRITION IN CHILDREN.

By SAMUEL NEWMAN, M. D., (Member Medical Commission, American Joint Distribution Committee).*

The problems of nutrition during the war and post war periods in Europe have been most vital to the very existence of the people and still are of great concern to those interested in the rearing of a young healthy generation in Europe. The question of practical and objective methods of determining the condition of nutrition among the millions of children became of paramount importance, since not all children in Europe could be considered in the scheme of supplementary feeding and other child welfare programs initiated by European and American relief agencies.

The question of malnutrition, and methods for its determination, have an entirely different aspect in private practice from that in social medicine. In private practice, or where the examination of only a small number of children is concerned, it is a mistake to consider malnutrition as a clinical entity and seek for a formula or mathematical index to express it. The physician must endeavor to go deeply into the history of the case and to bring into light the underlying cause of the poor state of nutrition of the individual which may be due to various causes, such as cardiac disease, metabolic disturbances, hyperthyroidism, faulty habits, etc. It is hardly probable that in America actual lack of food should be responsible for malnutrition.

However, the situation is entirely different when we are dealing with large groups of children, especially in Europe, which come under consideration from the nutritional viewpoint. Here malnutrition must be considered as a clinical condition *per se* and, when the necessity arises to select certain groups of children for certain feeding benefits, the need for objective methods whereby to determine the state of nutrition becomes evident—methods which will yield the same results in the hands of different examiners. The usual ratings, such as "good," "bad," "very bad," will suffer very much from the personal element of the examiners, and will not always admit those who, in the opinion of critical parents or communities, are entitled to the feeding benefits, and will not be at all applicable to the examination of large groups of children.

Personally I was faced many a time with responsibility for selecting certain groups of children for various benefits, such as supplementary feeding, summer colonies, tuberculosis senatoria, etc., from among war orphans, street and school children in Poland. The different standards of physical development used in the States as a measure of nutrition could not be applied in Poland for the reason that their use even in America is open to serious objections. All these standards state the degree of nutrition in terms of *weight* in relation to *height*. The fundamental objection to these standards are the following:

a. The height-weight index, or relation, varies with different races.

b. The relation of body weight—a quantity of three dimensions—to body length—a linear measure, is mathematically wrong and can by no means express a true inner relation between them, unless a formula is found whereby weight and length are reduced either to linear or cubic measures.

c. Anthropometric studies have shown that the body weight curve is a truer index to growth than body length. The standing height includes both trunk and lower extemities, but these do not grow as a functional unit. The trunk and the lower extremities both grow in accordance with an index of their own, therefore the comparison of standing heights is false for they represent merely the sum of different functional units—the trunk and the extremities—each growing in accordance with a law peculiar to itself.

In view of the above, a simple weight-and-length table could not be used in a country where the standing height of the children was subjected to even greater variations due to all sorts of disturbances of growth.

However, the war necessity proved also to be the mother of invention in the field of Nutrition Indexes. Space will not permit me to enumerate them all, neither is it necessary, as many have not yet stood the tests of time and critical application. I shall mention here two nutrition indexes and a brief clinical method to determine the state of nutrition in a child.

The Rohrer Index. The Child Welfare program of the Quaker Relief Mission to Germany depended upon the selection of children as its

*Dr. Newman is a member of the Medical Society of Virginia and was connected with the Health Department of Danville, Va., prior to becoming a member of the Commission. He is now attending the Children's Clinic, University of Vienna.

beneficiaries on the index devised by Rohrer, in Germany. This gives an expression of body volume, i. e. weight, thus: "Body weight X 100: length cubed." (Hundred times the weight of the body divided by the length of the body after it has been raised to the third power.)

This index, extensively used in Berlin in the examination of thousands of children, has been subjected to great criticism in Germany. In the examination of eighteen thousand children in Munich in accordance with the Rohrer Index it was noticed that many children looked far better than their grade obtained through the use of the index. Also the experience of school physicians in Germany spoke against the correctness of the values obtained for length in certain age groups, by means of the Rohrer Index. Personally I have had no experience with the Rohrer Index.

The Pelidisi Index. Professor Pirquet of Vienna made the observation that the sitting height of an individual, that is the distance from the top of skull to the sitting level, is equal to the cube root of ten times his body weight. This relationship is expressed by the following formula:

$$Si = \sqrt[3]{10 \text{ weight}} \quad \text{or,} \quad Si^3 = 10 \text{ weight}$$

By dividing the cube root of ten times the body weight we get the figure *one*, or

$$\sqrt[3]{\frac{10 \text{ weight}}{\text{sitting height}}} \quad \text{Equals 1.}$$

For convenience, we make this one 100 in order not to have to deal with decimals.

Now this relationship of *sitting height* to body weight—not standing height—has proved to be applicable to examinations of hundreds of thousands of children in Austria. The feeding program of the American Relief Administration in Austria was based upon the selection of children by means of the Pelidisi Index. A normal individual should have a pelidisi of 100. Above 100 means overfeeding and below 94.5 means malnutrition. In the practical application of this Index of Nutrition all children with a pelidisi of 93 were at once admitted to the feeding stations.

This relationship of *sitting height* raised to the 3rd power being equal to 10 times the body weight, has been verified by Pirquet in the examination of foetuses, new-born, infants, children and adults. This relation holds good for every period of life and only slight variations are to be taken cognizance of; namely, fat and well nourished infants reach an index of 100, while muscular adults show an index of 105. In school children a pelidisi from 95 to 100 is normal, below 95 is under nourished.

In selecting large groups of children and in classifying them in accordance with the varying degrees of undernourishment, the Pelidisi Index of Pirquet is the best and quickest method we have and can be carried out even by laymen. The determination is made very easily by means of the ordinary technical sliding rule or by means of the simple Pirquet Pelidisi table. I have had considerable experience with this method and it checks up fairly well with closer clinical examinations. The word "pelidisi" is not an accidentally coined word, but simply expresses the true relationship of the sitting height to body weight which Pirquet discovered. Thus—Pondus (weight), decies (ten times), linear (extracting root), diviso (divided through), sidentis (sitting height) expresses the relation.

A concise clinical method of determining the degree of undernourishment which can also be reduced to a schematic formula is the Sacratama method, also devised by Professor Pirquet. Pirquet states that in the picure of nutrition four (4) main components enter; namely, (*sanguis*) blood, (*crassitudo*) fat, (*turgor*) water content of subcutaneous tissue, and (muscularis) degree of muscular development. These four qualities are abbreviated thus.

S=blood
Cr=fat
T=turgor
M=muscle.

Any of these four components or qualities may be increased or decreased. The degree of increase or decrease is expressed by the vowels *i, e, a, o, u,* in the order of the lesser depth of the vowel sound. Thus—

i=very great; excessive; super-abundant.
e=increased; more; much; abundant.
a=normal.
o=decreased, less.
u=very little; almost absent.

The physician proceeds with the examination as follows: The child strips to his waist and the color of the skin is noticed as to its blood content. If normal the physician writes

Sa. Now a fold of flesh is raised below the clavicle and the fat content is noticed. If increased *Cre* is written down. Now a fold of skin is lifted up on the forearm. In case of the diminished turgor a fold is formed which stands up for a little while. In marasmic children we all noticed how the skin lies over the body in folds because of the lack of water in the subcutaneous tissues. If the skin fits well over the contour of the extremity the turgor is normal, hence *Ta* is written down. Lastly the degree of muscular development is noticed in the arms. The muscles may be weak and flabby, hence *Mo* is written down. We thus obtain the key word *Sacretamo*, which means a child with a normal blood content, very fat, normal turgor and weak muscular development. Similarly a child may obtain the formula *socrotomo*, which means pale and lean, with flabby muscles and diminshed turgor.

The classification of a group of children in accordance with varying degrees of undernourishment takes places after the sacratama method thus: A normal child has a rating of sacratama, that means he has not a single bad mark. Such a child belongs in the zero class. A child with one bad vowel, in the *one* class, etc.

No bad vowel	in 0 class
One bad vowel	in 1 class
Two bad vowels	in 2 class
Three bad vowels	in 3 class

After a little experience this method of examination gives the physician a great deal of clinical insight and teaches him that the various bad or good vowels he obtains in the examinations are not accidental but stand in definite relation to clinical conditions which the child has undergone. For instance, very diminished turgor will indicate an acute condition, for in chronic conditions, even though the blood content and the muscular development may be poor, yet the turgor accommodates itself to the underlying tissue and no fold of skin can be readily raised—that will mean that the turgor for this particular condition is normal whereas in relation to true health it is very much diminished.

In the Children's Clinic of the University of Vienna, pelidisi and sacratama determinations of all patients are a matter of routine and in a compact way give a real insight into the clinical history of the child.

REFERENCES.

Wagner, Richard: Zeitschr. f. Kinderheil, 28, p. 38, 1921.

Kaup, J.: Munch. Med. Wochenschrift, No. 3, p. 976, 1921.

Reports of Cases

INSULIN IN DIABETES.

A Preliminary note on Personal Experience in the Use of Insulin

By ALEXANDER G. BROWN, Jr., M. D., Richmond, Va.

Insulin (Lilly) is an aqueous solution of the active principle obtained from the Islets of Langerhans in the pancreas. This extract has been used in the treatment of human diabetes during the past year in several clinics in this country and Canada. It has been made under license from the University of Toronto which controls the product. Those who were privileged to participate in the investigation during this early stage of its development were requested to refrain from publication until a considerable amount of clinical data had been accumulated and the Toronto group had gotten ready the publications of their observations. The preliminary papers of the Toronto group have been published for several months and their final conclusions are soon to appear in print. And so, now, others who have had opportunity to use and observe Insulin (Lilly) during this general experimental investigation have been notified of not only their release from further necessity for secrecy regarding results observed, but, on the contrary are urged to submit the results of their clinical and experimental observations to the profession.

The chapter of events and course of experimental development which entered into the evaluation of this product is a story of definite scientific interest and will have a place in the annals of medicine for all time. But we shall not tarry on this phase of its interest.

The unit is the standard of measurement of insulin. The unit of insulin originally adapted was the amount required to lower the normal blood sugar of a one kilogram rabbit to 0.45 per cent., at which convulsions generally occur. This was taken as the standard of dosage; but its standardization has been very difficult of uniformity. It is expected that in the near future considerable improvement may be expected in this. Of course, the effect on human diabetes must vary with individuals as there is variability in the power to burn carbohydrate. A unit of insulin, when injected into a human diabetic, enables the

patient, it is believed, to utilize or store from 1 to 4 grams more of carbohydrate than he could before administration. The number of units required to maintain a nearly normal blood-sugar, a sugar free urine, with a limited carbohydrate intake, is the amount needed for the patient under treatment.

Our experience with Insulin began on November 15, 1922. From that time up to the present time, April 28, 1923, we have been using it daily. We believe the claim made for it by its discoverers and the reactions it produces in the animal experimentation are justified by our observations.

In our clinical observations of it in the Stuart Circle Hospital, its effect upon the blood sugar of the patients was definite and uniform. Our first patient was brought in the Hospital in a semi-comatose condition, with a blood sugar of 426 milligrams per 100 cubic centimeters of blood; with a urine showing marked reactions of a diacetic acid, and a urine heavily loaded with sugar. The first day insulin was given in dosage of 8 units every hour for 12 hours. The second day the insulin was continued every hour for 12 hours. The urine was examined every hour without noting any change in the sugar reaction or in the diacetic acid.

On November the 17th, 10 units were given every hour for 12 hours. The patient's clinical appearance began to show marked improvement, but laboratory findings of urine showed no marked change. On November 18th, the fourth day of his treatment with insulin, 10 units were given the patient subcutaneously every hour until the fourth dose, when the urine reports from the laboratory began to show improvement. The sugar was disappearing: the diacetic acid reaction was becoming faint; and the blood-sugar had fallen to 168 milligrams per 100 c.c. of blood.

On November 28th, thirteen days after entering the hospital, this patient was being given subcutaneously only 10 units of insulin three times daily; he was receiving in his diet 30 grams of carbohydrate, 86 grams of protein, and 184 grams of fat; he was sugar-free in the urine; he was free of diacetic acid; and his blood sugar was 153 milligrams per 100 c.c. of blood. The patient had subsequent history of interest which will be reported in full later.

Another case was admitted to Stuart Circle Hospital January 4, 1923, in a state of profound diabetic coma. The coma began about eleven hours before she was brought to the hospital. A catheterized specimen of urine showed an estimated 5 per cent. of sugar; the blood sugar was 580 milligrams per 100 c.c. of blood.

Insulin (10 units) was given subcutaneously at 7 A. M., 8:30 A. M., 9 A. M., 9:30 A. M. Twenty units were given at 10:30 A. M., 11:30 A. M., 12:30 P. M., 1:30 P. M., 2:30 P. M., 3:30 P. M., 4:30 P. M., 5:30 P. M.

January 5th, patient was unimproved; coma was deep; 10 units of insulin was given every hour for 12 hours. Blood-sugar examinations showed 320 milligrams per 100 c.c. of blood.

January 6th, patient was unimproved; coma was profound. Insulin, 10 units every hour, was continued. Blood-sugar was found to be 302 milligrams per 100 c.c. of blood. The patient was fed through a stomach tube liberal amounts of fruit juices and was given glucose intravenously. The patient died in coma. The marked drop of blood sugar from 580 to 302 milligrams of blood-sugar was significant.

The daily use of insulin in our hands has disclosed the following results:—

A. Favorable influence in diabetes in reducing hypergylcemia.

B. Favorable effect on ketonuria.

C. Favorable effect on urinary sugar.

D. Favorable influence on the increase of carbohydrate metabolism.

E. Favorable effect upon the mental symptoms of diabetes—giving a decided improvement in morale.

F. Favorable influence on the physical strength of diabetics.

G. Favorable effect on the distressing symptoms of diabetics, as thirst, inordinate appetite, polyuria, etc.

H. Favorable effect on all skin lesions, boils, scalp ulcers, hang-nails, cuts, hair, eruptions, accidental infections of diabetes.

Insulin does not supplant the diet-treatment of diabetes. While insulin does increase the power of the diabetic to burn carbohydrate, the dietary management of the patient is quite as necessary as heretofore. One of the problems before the internist in the use of insulin in diabetes is the adjustment of the dosage of insulin to diet; much the same method is followed in arranging the diet. The carbohydrate tolerance is determined, the ketogenic and anti-ketogenic balance is struck, the nitrogen balance is maintained. Insulin will make

each of the problems easier. Insulin is an agent that enables the crippled pancreas to receive help from the outside. There are untold possibilities in insulin for the control of hyperglycemia.

The treatment of coma is wonderfully advanced by the discovery of insulin. It undoubtedly is a direct and specific product which may be utilized with confidence in acidosis and coma. Not only is experimental proof given in the work of the Toronto group but, in the cases that have come under our immediate observation, insulin has shown undoubted favorable influence in acidosis and coma.

Precautionary measures in the use of insulin are necessary. It is undoubtedly a potent agent that is fraught with no inconsiderable risk. No one should attempt to use insulin unless the dosage and the effect is carefully checked by competent laboratory examinations of the urine and the blood chemistry. The too sudden lowering of blood sugar may make the diabetic the victim of convulsions and death may result. The medical profession and the public must be on their guard against such serious accidents as may result from the ill-advised and unskilful use of insulin. Already the wide publicity given this product in the lay press makes for serious dangers which must be averted by the careful and watchful use of the great discovery.

The Lilly Research Laboratories deserve our grateful appreciation for the large amount of insulin with which they supplied us free of charge in our clinical study of its use in diabetes.

Stuart Circle Hospital.

Analyses, Selections, Etc.

Graves' Syndrome and the Involuntary Nervous System.

Under the general caption, "Studies of Graves' Syndrome and the Involuntary Nervous System," Kessel, Lieb and Hyman[1] report in a series of nine articles a study designed "to promulgate a definite policy for the management of individuals suffering from Graves' Syndrome." Among the more striking conclusions reached by the authors are, that the complete picture of Graves' Syndrome may exist without elevation of basal metabolism, the normal metabolism establishing a differential diagnosis from Graves' Syndrome; and that there is a marked tendency in patients with exophthalmic goiter to recover spontaneously.

Paper I[1] deals with thyroid enlargement in individuals without sympathomimetic manifestations. The authors have adopted the term of Barger and Dale, "Sympathomimetic," to denote manifestations that are tantamount to electrical stimulation of the thoracicolumbar division of the involuntary nervous system, or to stimulation of the same system by adrenalin. In other words, *anatomically*, the term has reference to the same part of the nervous system as the "Sympathicotonia" of Eppinger and Hess.

Patients with "Graves' Syndrome," but with no significant elevation of basal metabolism, they regard as subjects of "autonomic imbalance," and the clinical study of these patients is presented in paper II[2].

The clinical study of 50 consecutive cases of exophthalmic goiter, (Graves' Syndrome with elevated basal metabolism) is reported in paper III[3].

A study of the physiology and pharmacology of the involuntary nervous system, with an "attempt to find an index for the activity of the involuntary nervous system" is described in paper IV[4].

Papers V, VI and VII[4] deal with the application of this index to the role of alleged etiologic and therapeutic influences, as well as to factors which maintain the tonicity of the involuntary nervous system.

Paper VIII[5] is a general summary of the clinical and laboratory work on the involuntary nervous system.

Paper IX[6] is a discussion of pathogenesis and an evaluation of popular therapeutic procedures.

The general conclusions reached in the nine articles are as follows:[3]

1. Thyroid hyperplasia and thyroid adenoma may exist for years without at any time causing sympathomimetic symptoms or alteration in metabolism.

2. Disturbances of the involuntary nervous system clinically occur frequently (autonomic imbalance).

3. Such disturbances are usually not attended by metabolic elevation.

4. While these clinical manifestations of disturbances of the involuntary nervous system (autonomic imbalance) are often associ-

XUM

ated with thryroid hyperplasia, there is no reason to believe that the thyroid enlargement is causative and many reasons for thinking that it is secondary and symptomatic.

5. In exophthalmic goiter the dominant derangement is in the realm of the involuntary nervous system. This may not be primary, but the primary cause, whatever it be, must at least operate through the mediation of the involuntary nervous system.

6. The primary cause of exophthalmic goiter must be sympathomimetic.

7. There is a close relationship between exophthalmic goiter and autonomic imbalance. The latter usually presages the former, and is probably a stage in its development.

8. Evidence is presented to show that thyroxin is not sympathomimetic either directly or indirectly through synergism with epinephrin, even if it be granted that epinephrin controls the involuntary nervous system either in the tonic state or in emergency.

There is a marked tendency in patients with exophthalmic goiter to recover spontaneously. This factor must be carefully considered in evaluating "specific" therapeutic procedures.

REFERENCES.

1. Am. Jour. Med. Sci., 1923, 165, 384.
2. Am. Jour. Med. Sci., 1923, 165.
3. Arch. Int. Med., 1923, 31, 433.
4. Jour. Exp. Pharm. and Therap., 1922, 63, 60, 68, 83, 88.
5. Jour. Am. Med. Asso., 1922, 79, 1099.
6. Jour. Am. Med. Asso., 1922, 79, 1213.

Spinal Drainage Following Intravenous Arsphenamine.

From the N. Y. Urological Institute. Author's conclusions relative to the treatment of syphilis of the nervous system are:

1. No single method of treatment is applicable to all cases.

2. The intravenous administration of arsphenamine is the method of choice.

3. Spinal drainage after intravenous administration of arsphenamine is not a hazardous procedure.

4. Drainage will benefit some cases which have arrived at a position of inertia under intravenous administration alone.

5. As satisfactory clinical and serological results may be obtained by intravenous arsphenamine and drainage as are produced by intraspinous method and without the severe root-pains frequently set up by the latter method. (C. Burns Craig, Journal of Nervous and Mental Disease, August, 1922).

Sulpharsphenamine: Its Manufacture and its Chemical and Chemotherapeutic Properties.

The data presented show that sulpharsphenamine is an arsphenamine derivative very closely related in chemical structure to neoarsphenamine. This slight change in chemical constitution, however, imparts to the drug certain definite advantages over neoarsphenamine, as (1) ease of manufacture, (2) great stability of the drug in dry form and in watery solutions, (3) constancy of toxic and parasiticidal action of different lots, and (4) suitability for hypodermic administration. Every one of these advantages is of far-reaching importance, when consideration is given to the fact that enormous numbers of doses of arsphenamine are used in the control of syphilis.

As far as the experimental evidence is concerned the above mentioned advantages of sulpharsphenamine are firmly established. However, it is strongly emphasized that before this drug can be introduced for general use, it will be necessary to give it an exhaustive trial as to its curative power in human syphilis. (Carl Voegtlin, J. M. Johnson, Helen Dyer, *Public Health Reports*, November 10, 1922.)

Treatment of Neurosyphilis.

Every case of neurosyphilis, diagnostically established by combined clinical and serological tests, demands assiduous treatment of the general syphilitic infection by every means at our disposal. Antisyphilitic remedies, including mercury, iodides, arsenobenzol, etc., are to be administered by the most efficient route, whether by the mouth, by inunction or fumigation, by intramuscular injection, or by intravenous injection into the blood stream. In no case should our remedies be directed exclusively to the nervous system.

In gummatous and meningo-vascular neurosyphilis the foregoing anti-syphilitic treatment is usually all that is necessary.

Some cases of parenchymatous respond, but the majority are resistant to general antisyphilitic treatment, even when carefully and thoroughly carried out. Such cases are those which should be selected for supplementary

subarachnoid treatment, whether intrathecal or intracisternal.

Intraspinal treatment by salvarsanized serum prepared from the patient's own blood or by human or horse serum mercurialized in vitro, is specially suitable for cases of tabes and of cerebrospinal syphilis, provided cerebrospinal fluid shows evidence of active meningeal reaction. It is also suitable for meningo-vascular spinal syphilis when resistant to ordinary treatment.

The direct intraspinal administration of arsenobenzol into the cerebrospinal fluid is liable to produce acute softening of the spinal cord and should be discarded.

Cases of general paralysis of optic tabes, of tabo paralysis, and of tabes with negative reactions in the cerebrospinal fluid, are not likely to benefit by intraspinal treatment.

Cases of meningo-vascular cerebral syphilis benefit much by intracisternal administration of salvarsanized serum.

General paralysis, if recognized in the early stage, is definitely benefited by intracisternal treatment. This method is superior in efficacy to intraventricular operation and entails much less risk to the patient.

Pyrexial treatment of early general paralysis—for example by tuberculin, nuclein, etc., may induce temporary remissions in the disease. So also can simple drainage of the cerebrospinal fluid, combined with general antisyphilitic treatment.

Advanced cases of general paralysis, with extensive destruction of cortical nerve elements, are hopeless for curative treatment by any method whatever. (James Purves-Stewart, *British Medical Journal*, October 7, 1922.)

Treatment of Neurosphilis with Special Reference to the Changes in the Cerebrospinal Fluid.

Two hundred cases were treated as regards the question of serological improvement: the results obtained in the treatment of fully established cases of neurosyphilis show a constant and progressive fall in the cell count until this reaches normal limits, almost constant modification of the colloidal gold reactions in the direction of a negative result, and in occasional cases, a change in the Wassermann reaction from positive to negative.

Improvement as regards gait, bladder control, lightning pains, and general health has been repeatedly observed, though the lapse of time is not yet sufficient to warrant the conclusion that the disease has been arrested. The whole hope of the successful treatment of tabes and other forms of neurosyphilis lies in early diagnosis.

The routine treatment adopted has been a preliminary course of mercury and iodide for an average of two weeks, followed by a series of from 20 to 40 injections of 0.45 to 0.6 gram novarsenobenzol given at 7 day intervals. After every fourth injection two weeks rest was given. In addition mercurial inunction according to the Aachen methods was carried out and intramuscular injections of intramine in 5 c. cm. doses were given at monthly intervals. No intrathecal therapy has been attempted and silver salvarsan has not been employed. (Douglas K. Adams, *British Medical Journal*, October 7, 1922.)

The Truth About Medicine

During March, the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-official Remedies:

Abbott Laboratories
Sulpharsphenamine-Abbott.
Borcherdt Malt Extract Co.
Borcherdt's Cod Liver Oil and Iron Iodide.
E. R. Squibb & Sons
Sulpharsphenamine-Squibb
Nonproprietary Article
Sulpharsphenamine.

NEW AND NON-OFFICIAL REMEDIES.

Mercurosal. — Disodiumhydroxymercurisalicyloxyacetate. Mercurosal contains from 43.0 to 43.8 per cent. of mercury in organic combination. It is claimed that mercurosal is relatively free from irritant action, that it is eliminated without untoward effects on the kidney, and that the toxicity is relatively lower than mercuric chloride or mercuric salicylate. Mercurosal is intended for the mercurial treatment of syphilis. It is administered either intramuscularly or intravenously. Mercurosal is marketed in two forms: Mercurosal Intravenous, tubes containing mercurosal 0.1 Gm., and Mercurosal Intramuscular, tubes containing mercurosal 0.05 Gm. Parke, Davis and Co., Detroit, Mich. (Jour. A. M. A., March 24, 1923, page 844).

Pneumococcus Antibody Solution, Types I, II and III combined.—An aqueous solution of the specific pneumococcus anti-bodies, Types I, II and III in equal proportions, approximately free from the proteins of horse serum. There is some evidence that this antibody solution is of value in the treatment of lobar pneumonia.

Pneumococcus Antibody Solution, Types I, II and III Combined.—N. N. R., marketed in packages of one 50 Cc. double-ended vials with a complete intravenous outfit, and in packages of one 50 Cc. double-ended vials. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., March 24, 1923, page 844).

Sulpharsphenamine.—The salt, disodiumdiomin-

odihydroxyarsenobenzenedimethylenesulphonate, adjusted by the addition of inorganic salt to an arsenic content of from 18 to 20 per cent. The arsenic content of 3 parts of sulpharsphenamine is approximately equal to two parts of arsphenamine. The actions and uses of sulpharsphenamine are the same as those of neoarsphenamine, over which it is claimed to have the advantage of greater stability of solution in the presence of air and of permitting subcutaneous injection. For subcutaneous or intramuscular use the drug is dissolved in sterile, freshly distilled water in the proportion of about 0.1 Gm. to 0.3 Gc.; for intravenous use a greater dilution is desirable. (Jour. A. M. A., March 31, 1923, page 919.)

Sulpharsphenamine-Abbott.—A brand of sulpharsphenamine—N. N. R. It is marketed in ampules containing respectively, 0.2 Gm., 0.3 Gm., 0.4 Gm., and 0.6 Gm. The Abbott Laboratories, Chicago. (Jour. A. M. A., March 31, 1923, page 919).

Propaganda for Reform.

Peralga, a new German Synthetic.—For the past few years American Physicians have been relatively free from the propaganda of the foreign synthetic drugs—real or alleged. Recently, however, there have been signs of revival of this type of product. One of the products being endowed with the halo of creative chemistry is Peralga (Schering and Glatz), known in Europe as Veramon. The product is claimed to have been originated in the pharmacologic loboratory of Professor Starkenstein, University of Prague (who has lent his name to a number of statements valuable to the proprietary interests). Peralga is claimed to be a definite chemical compound, made by heating a mixture of barbital and amidopyrin, and it is claimed that this compound is absorbed without being split up into its component radicles. The A. M. A. Chemical Laboratory investigated Peralga. The examination developed that Peralga is not a definite chemical compound as claimed, but essentially a mixture of barbital and amidopyrin, containing an impurity produced in the fusion of the mixture. To determine if Peralga will produce any effects different from a mechanical mixture of barbital and amidopyrin in the same proportion, a specimen of Peralga and a mixture of barbital and amidopyrin in the same proportions as in Peralga were sent to the Pharmacologic Laboratory of Cornell University Medical College for comparative tests. The summary of the laboratory report was: "We can see no difference in the behaviour of cats towards similar doses of the two preparations; the mechanical mixture made in the A. M. A. Chemical Laboratory and the preparation of Schering and Glatz—and they show very little difference between similar doses of barbital and those contained in Peralga. * * *

"Of course there is no chance of making observations on cats that would show analgesic actions in headache. But since the observable effects on cats are so nearly identical, it is only fair to presume that the 'synthetic' and the mixture are practically alike in action." (Jour. A. M. A., March 31, 1923, page 942).

Prescribing Codein.—Codein is a derivative of opium and hence prescriptions for it come within the purview of the Harrison Narcotic Act, no matter what the individual physician may believe in respect to its habit forming properties. (Jour. A. M. A., March 31, 1923, page 945).

Biologic Reactions of Arsphenamin.—The complexity of the physical and chemical properties of arsphenamin probably accounts for the complexity of its biologic reactions resulting from the passage through the body. Among the most disturbing of these reactions are the nitritoid or anaphylactoid symptoms occurring after intravenous injection. The earlier studies of the anaphylactoid reactions from arsphenamin cleared up certain features, but left the underlying causes untouched. The investigations of Jean Oliver and his collaborators lead to the conception that arsphenamine can exist in the colloidal state temporarily at least, and that the temporariness of this state is essential to anaphylactoid reactions. The investigators find that arsphenamin has a fairly constant agglutinating titer for blood corpuscles. The presence of electrolyte is essential for agglutination. The work suggests that agglutination by arsphenamin occurs during the transition stage from its colloidal into the crystalloidal state in the circulation, and that stabilization in the colloidal state prevents the agglutination. From their work they conclude that there are two phases to the reactions from arsphenamin: (1) the early or physical phase, which is concerned with the physical properties of the agent and results in the corpuscular agglutination with multiple embolism, the outcome being fatal sometimes, and (2) the later or chemical phase that results in parenchymatous degeneration of viscera (kidney and liver), this being due to the action of the arsenic ions in the usual way. (Jour. A. M. A., March 31, 1923, page 920).

Book Announcements

Essentials of Surgery. A Textbook of Surgery for Students and Graduate Nurses and for Those Interested in the Care of the Sick. By ARCHIBALD LEETE McDONALD, M. D., of Johns Hopkins University; formerly in charge of Department of Anatomy, University of North Dakota, etc. Second Edition Revised. Philadelphia and London. J. B. Lippincott Company. One of series of Lippincott's Nursing Manuals. Cloth. 1923. 8vo. 293 pages including a Glossary and 49 illustrations. Price, $2.50.

Physics and Chemistry for Nurses. By A. R. BLISS, JR., A. M. Phm. D., M. D. Lecturer on Chemistry and Materia Medica, Grady Hospital Training School for Nurses, Atlanta; etc., and A. H. OLIVE, A. M., Ph. Ch., Phm. D., Lecturer on Chemistry, Hillman Hospital Training School for Nurses, Birmingham, etc., with collaborators. Third Edition Thoroughly Revised and Rewritten and conforming to requirements of the standard curriculum (1922) of the National League of Nursing Education. Philadelphia and London. J. B. Lippincott Company. One of series of Lippincott's Nursing Manuals. Cloth. 1923. 8vo. 190 pages including a Glossary and 70 illustrations. Price, $2.50.

The Form and Functions of the Central Nervous System. An introduction to the Study of Nervous Diseases. By FREDERICK TILNEY, M. D., Ph. D., Professor of Neurology, Columbia University; Attending Neurologist, Presbyterian Hospital, and New York Neurological Institute, etc., and HENRY ALSOP RILEY, A. M., M. D., Associate in Neurology, Columbia University, etc. Foreword by GEORGE S. HUNTINGTON, Sc.D., M. D., Professor of Anatomy, Columbia University. Second Edition. 591 figures containing 763 illustrations of which 56 are colored. New York. Paul B. Hoeber. 1923. 8vo. 1019 pages. Cloth. Price $12.00.

Virginia Medical Monthly

FOUNDED BY LANDON B. EDWARDS, M. D., APRIL, 1874.
OWNED BY THE MEDICAL SOCIETY OF VIRGINIA.
PUBLISHED BY THE PUBLISHING COMMITTEE.

A. G. BROWN, Jr., M. D., Chairman, Richmond, Va.
B. R. TUCKER, M. D., Richmond, Va.
P. W. HOWLE, M. D., Richmond, Va.
E. L. KENDIG, M. D., Victoria, Va.
A. L. GRAY, M. D., Richmond, Va.
ALEX. G. BROWN, Jr., M. D., Editor.
G. H. WINFREY, Business Manager and Secretary-Treasurer.
AGNES V. EDWARDS, Editor's Assistant and Assistant Manager.

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Subscription Price: $2.00 per annum in advance.
Single Copies 20c.

Vol. 50 MAY, 1923 No. 2

Editorial

The Heart In Old Age.

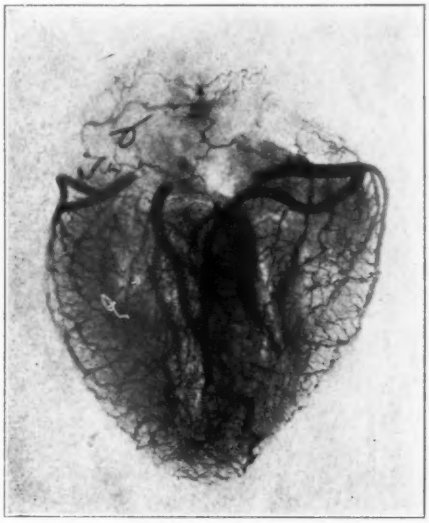
He was seventy-three. He never had had an acute sickness. He was Cornish. He had worked in youth for years as a miner. For the last ten years he has been retired from active business and has lived with his son on a farm. He has taken care of fifty hens, one cow, a small garden, and in winter cut fire wood and performed a few duties about the place. He has had a good appetite; he has grown stout.

Within the past three months his breathing has become more frequent on exertion; within the last three weeks he has had shortness of breath; his legs have swelled; his heart now beats fast; his pulse has become rapid and irregular.

The heart of old age is grossly neglected. For seventy-three years, in this case, it has been beating one hundred and fifty thousand times daily; or, for seventy years, this man's heart has made three billion, eight hundred and thirty-two million and five hundred thousand contractions, without showing to him, at least, any signs of failure in compensation, or failure to do its work. And here within the last few months, after contracting and maintaining a balanced circulation through the elaborate vascular channels of the body, it has begun to show gross and serious evidence that it will no longer, for any considerable period of time, continue to perform its ceaseless task.

This old man's heart is going on a strike. This old man's heart is losing its conductivity, rhythmicity, contractility and irritability. After three billion odd beats, it is beginning to fail.

As age advances, there is a right side hypertrophy in the heart and the distribution of the blood supply undergoes considerable alteration with the evidence of increase in tortuosity. The blood supply of the average heart of the first decade, in its main branches, pursues a straight and even course.



*Roetgenogram of the blood supply in the average heart of the first decade.

In the seventh decade you observe the increased relative anemia of the right side, the marked tortuosity of the vessels, the rich and abundant septal anastomoses, and the well-developed fat-vessel network.

One of the most common causes of heart failure in the old is disturbance in the coronary circulation that brings about poor heart nutrition. Of course, this may occur in a sudden manner by an embolus or thrombus. But the most common way in whch this occurs is sclerosis in the coronary vessels or in the aorta. The nutritional changes in the heart muscle will follow upon circulatory sclerosis. Likewise, it will be found that myocardial degeneration will occur in the muscular deficiency due to muscular fatigue or from general constitutional diseases where there has been over years a retention of body poisons.

Myocardial weakness of old age may show

itself as a result of high blood pressure resistance or from over-work or severe physical labor. The outstanding symptom in these cases is the evidence of cardiac deficiency. The deficiency may be ushered in by some symptom-complex like an attack of angina pectoris, an Adams-Stokes' syndrome, and an arrhythmia, or a pulmonary edema. The symptom may be mere faintness or dizziness. Or there may be the serious sign of breathlessness or a sense of oppression. Pain may be the dominant symptom, sometimes associated with work af-

*Roentgenogram of the blood supply in the average heart of the seventh decade.

ter meals. Eructation may relieve the pain. Erroneously, this important cardiac symptom is overlooked by both the doctor and the patient. Precordial fullness, a lump in the chest, difficulty of breathing in a man in the sixth or seventh decade, are serious signs. Dyspnea or anginal pain in the sixth or seventh decade means that the myocardial structure of the body is becoming ominously defective. Observation of the apex beat shows it is displaced, may be beyond the nipple line, and the impact and impulse are diffuse and feeble. There is also pulsation in the vessels of the neck to a marked degree. The heart may be beating regularly but too slowly; it may be beating rapidly and regularly or irregularly; it may be intermitting. But irregularity in systolic contraction is the most common manifestation of its impending failure. The arrhythmia may be extrasystoles or auricular fibrillation. The heart is enlarged and cardiac dullness is increased. As you place your stethoscope over the heart, you note the distant feeble heart sounds; the first sound may be sharp and short and the second pulmonic or aortic may be accentuated, but repeated examination may disclose the gradual loss of this accentuation. A systolic murmur along the base is usually heard. The murmur may be soft or blowing or may be harsh and have musical quality, depending upon the vegetative growth about the endocardiac openings. Murmur may be increased by exercise, or discovered at one time and not heard at another. Venous pulse and tricuspid regurgitation and pulmonary edema may be added signs of impending heart failure.

What can be done for these old hearts?

I. Carefully study the whole body.

II. Carefully study the habits.

III. Put the patient to bed.

IV. Make a blood chemistry examination, blood sugar, blood urea, non-protein, nitrogen.

V. Look for focal infections and eliminate them.

VI. Regulate the diet and reduce the intake of food at night.

VII. Consider digitalis, caffein, strychnine.

VIII. Cut out salt and meat.

IX. Admonish against over-exertion.

Angina Pectoris.

The question of anastomosis of the coronary arteries seems to have been very much interlinked with the question of the production of angina pectoris. But now, it is generally conceded that anastomosis* exists bewteen the right and left coronary arteries, in their capillary as well as their precapillary distribution; that anastomosis exists between the branches of each coronary artery; that anastomosis exists between coronary arteries and vessels from adjacent and attached organs; that anastomosis in the heart is universal and abundant. The coronaries do anastomose and angina pectoris is not due to the closure of one artery and failure of collateral circulation to be established. It is rather due to combined

*Roentgenograms taken from "The Blood Supply to the Heart," by Louis Gross, M. D., C. M., Paul B. Hoeber, New York, publisher.

*"The Blood Supply to the Heart," by Louis Gross, M. D., C. M., Paul B. Hoeber, New York, publisher.

disease of the coronary arteries in which inadequate cardiac circulation may be maintained. It may be due, however, to diseases not in the coronary, but in the aorta, by partial or complete occlusion, of the lumen of the coronaries at the origin; such as, aortitis or valvulitis of the aortic valve.

Of course, the coronaries may participate in a general arteriosclerosis of the systemic vessels and the same ischemia of the myocardium may be produced, resulting in the anginal syndrome.

An embolus or thrombus also may block one coronary and the age of the patient may be such that the anastomoses are incapable of affording an adequate arterial inflow of blood and thus may ensue the same clinical picture.

Again, on the principle of the intermittent claudication which occurs in the abdominal arteries, the coronaries may become, from some cause, suddenly in arterial spasm and the blood supply of the contracting myocardium may become consequently restricted to the point of producing muscle pain or angina.

Anginal attacks come in the fifth or six decade from fast walking, walking against the wind, some form of over-exertion, from sudden emotion, as fear or anger, from overeating, a distended stomach. The condition is characterized by an intense pressure in the upper chest; the vise-like pain is sometimes agonizing, possibly only a substernal ache or radiation of pain down the left arm is felt, mental distress and sense of impending death. The attack may terminate by sudden death, by an attack of syncope, by feeling of exhaustion and evidence of heart dilatation. The patient may, however, recover in a short time.

The patient who once has an attack of true angina pectoris should receive a painstaking examination of the entire body and the problem of prolonging the life by preventing return attacks should be fairly faced.

The Heart in Thyroid Disease.

The hyperfunctioning thyroid adenoma and exophthalmic goiter produces and discharges into the systemic circulation an excessive amount of thyroxin, the physiologic and normal active principle of the thyroid gland, and, after an indefinite period of time, this product, probably perverted somewhat, in the case of exophthalmic goiter, produces two fundamental reactions on the heart. This effect upon the heart should be clearly appreciated because cardiac activity and function may play an important part in the clinical cause of hyperthyroidism.

The first effect is brought about by the excess of thyroxin in the tissues of the body. This makes for an elevation of the basal metabolic rate. This produces increased cardiac work, increased cardiac rate, increased contraction amplitude. The greater volume outflow of blood for each beat, which results, leads to hypertrophic changes in the heart muscle and eventually dilatation of the organ.

The second effect of thyroxin is on the heart muscle cells. The muscle structure, under the influence of excessive thyroxin, undergoes a degenerative myocarditis. Muscle fatigue results. Heart contractions may become irregular, following increased rate. The hypertrophy and dilatation of the heart may lead to its failure. The irregularities of the heart culminate in auricular fibrillation often times. In the Mayo Clinic,* auricular fibrillation was found in seven per cent of patients suffering with exophthalmic goiter and in nine per cent of cases of hyperthyroidism.

Auricular fibrillation may be present at times only, or it may be persistently present in these cases. Of course, its presence considerably accentuates the gravity of the prognosis; approximately, it is estimated, doubling cardiac mortality. Auricular fibrillation in the goiter heart may be taken to mean definite myocardial degeneration from overdoses and over time saturation of thyroxin. Of course, its persistence is a strong contraindication to operative procedure for the relief of goiter. Likewise, auricular flutter, with or without partial heart block, is a graver indication of muscular degeneration from thyroxin of hyperthyroidism and perversion of the secretion of exophthalmic goiter. Such cases are, strictly speaking, medical cases; while operation is indicated, no doubt, to curtail the hyperactivity of the diseased thyroid, the stage of the clinical evaluation that is characterized by auricular fibrillation (persistent) and auricular flutter is one to be managed by the internists, so far as cardiac irregularities go. It is in this goiter heart activity that massive digitalis administration is indicated by the internist. Digitalis saturation is needed. Digitalis to the point of vomiting and even to partial heart block may enable the internist to establish in the thyroxin poisoned myocardium

*"The Heart in Thyroid Disease," by Fred A. Willinus, Mayo Clinic, Rochester. Annals of Clinical Medicine, Jan., 1923.

some form of normal conduction, contractility, irritability and rhythmicity.

In our experience with digitalis in thyroxin cases, no one plan for its administration can be at once laid down. With the idea of bringing the myocardium under the effect of digitalis by mass attack, the administration for a period of seventy-two hours may be made by giving 2 c.c. (30 minims) every eight hours. Even larger doses may be required. Care should be exercised, however, remembering that the "couple beats," "nausea," "slowing pulse," or "heart block" are all signs of digitalization. The radial pulse must not be trusted. The stethoscope over the apex, the finger on the radial pulse, and the eye on the right supraclavicular space may give you the evidence of digitalis-control with fair accuracy.

News Notes

Dates Selected for State Meeting.

The Executive Council of the Medical Society of Virginia, at a session held April 27, selected Ooctober 16, 17, 18 and 19 as the dates for the Roanoke meeting of the State Society. It is hoped that all members of the Society will work for the success of this meeting and that as many as possible will attend. Roanoke doctors have been actively at work on their plans for sometime.

Nutrition Institute.

During the two weeks beginning April 9th, Dr. William R. P. Emerson, pediastrist, Boston, Mass., and his assistant, Miss Mabel Skilton, conducted an institute in Richmond on the nutritional problems of childhood. The institute, which was a decided success, was conducted under the auspices of the Virginia Co-Operative Child Welfare Committee, an organization composed of representatives from forty-six State and City organizations. Dr. C. C. Hudson, health officer of Richmond, served as chairman of this committee. Approximately one hundred and twenty public health workers from various parts of the State took advantage of this opportunity to learn more about this very important phase of public health work, and took the full two week's course. In addition to those taking the full course of instruction, some sixty others took most of the course during the second week.

The nutrition class was addressed by Prof. Harris Hart, State Superintendent of Public Instruction, Dr. Roy K. Flannagan, Assistant State Health Commissioner, Dr. L. T. Royster, of Norfolk, Dr. Beverley R. Tucker, of Richmond, Miss Agnes D. Randolph, Director of the Bureau of Tuberculosis Education of the State Health Department, and Mr. Irving R. Spear, of the Virginia Tuberculosis Association.

This was the thirtieth institute conducted by Dr. Emerson during the past three years, and his course of instruction here, as elsewhere, was exceedingly valuable to public health workers, especially those interested in school inspection. From investigations, Dr. Emerson's belief is that the problem of malnutrition of children is one with which the poor are not so much concerned as the rich, some of the prime causes of malnutrition being irregular habits of sleep, food, exercise and rest.

During Dr. Emerson's stay in Richmond five nutrition classes were organized in the Richmond public schools, and one class among the children of the Methodist Orphanage. The five classes organized in the public schools are being continued under the supervision of Dr. N. Thos. Ennett, Director of Medical Inspection of Schools. The class organized at the Methodist Orphanage is under the supervision of Dr. M. E. Nuckols, who has charge of the Orphanage medical work. Dr. James B. Stone, of Richmond, will be in charge of two classes which are being organized for mothers. It is expected that additional nutrition classes will be organized in the near future.

The Virginia-West Virginia Section, American College of Surgeons

Held a two day's session in Norfolk, Va., April 23 and 24, Dr. Lomax Gwathmey, Norfolk, presiding over the Virginia division, and Dr. J. Ross Hunter, Huntington, over the West Virginia Section. Dr. Julian L. Rawls, Norfolk, was secretary for the Virginia section, and Dr. Thos. W. Moore, Huntington, of the West Virginia section. Between thirty and forty physicians outside of Norfolk County registered attendance Excellent clinics were held at the various hospitals during the morning hours of both days. As the American College of Surgeons has made hospital standardization one of its principal works, much time was given to the discussion of this sub-

ject and much valuable information was elicited.

The new officers elected for the Virginia Section are: Dr. J. Shelton Horseley, Richmond, chairman; Dr. A. Murat Willis, Richmond, secretary; Dr. Stephen H. Watts, University, counselor. The place of the next meeting is to be decided later.

The Virginia Society of Oto-Laryngology and Ophthalmology

Held its annual meeting in Richmond, April 18, with an attendance of about seventy-five specialists. Eight new members were received at this meeting. Dr. Elbyrne G. Gill, of Roanoke, presided and delivered his address as president. A symposium on "Refraction" was handled by Drs. Emory Hill, Richmond, H. S. Hedges, Charlottesville, and Hunter McGuire, Winchester. Several other members also presented papers and Drs. Walter Lambert, New York, Lewis Fisher and H. M. Langdon, both of the latter of Philadelphia, read papers by invitation. Dr. Wells Eagleton, Newark, N. J., was prevented by illness from taking part in the program. Luncheon was tendered the visitors and out-of-town members at Commonwealth Club, by the Richmond Society of Oto-Laryngology and Ophthalmology.

It was decided to hold the next meeting in Lynchburg in the Spring of 1924. Dr. Joseph A. White, Richmnod, was elected president; Dr. James Morrison, Lynchburg, vice-president, and Dr. E. U. Wallerstein, Richmond, was re-elected secretary-treasurer.

The South Piedmont Medical Society

Met in Danville, Va., April 17, and had an excellent meeting. A number of interesting papers were read, including a symposium on Pneumonia. South Boston was selected as the next place of meeting and the following officers elected: President, Dr. P. W. Miles, Danville; vice-presidents, Drs. James Morrison, Lynchburg, S. T. A. Kent, Ingram, W. E. Jennings, Danville, and C. W. Tucker, Drakes Branch. Dr. George A. Stover, South Boston, was re-elected secretary-treasurer.

The San Francisco Meeting.

Official call has been issued for the seventy-fourth annual session of the American Medical Association in San Francisco, Cal., June 25-29, inclusive. The House of Delegates will convene on Monday, June 25th; the Scientific Assembly will open with the general meeting on the 26th, at 8 P. M.; the various sections of the scientific meeting will meet Wednesday, the 27tn, at 9 A. M. and 2 P. M., and subsequently according to their respective programs.

Many attractive side trips have been arranged. Those who wish to enjoy a short water trip may have an 18 hour ocean trip between Los Angeles and San Francisco, either going or returning.

The Salt Lake (Utah) County Medical Society has issued invitation for members to stop over in Salt Lake City, before or after the meeting, and, if you communicate with Dr. Floyd F. Hatch, secretary, Deseret Bank Building, Salt Lake City, Utah, as far in advance as possible, giving number in party and length of stopover, arrangements will be made to show visitors something of the beauties of that section. Other local medical organizations will also entertain visitors, especially those who are on special trains.

A special train will leave Chicago, over the Burlington Railroad at 11 p. m., June 20. This will make stops at a number of places and reach San Francisco at 5:30 p. m., June 25. Particulars as to this train and any other information may be obtained from Dr. W. E. Musgrave, chairman, Local Committee of Arrangements, 808 Balboa Bldg., San Francisco, Cal.

Another special to this meeting will be that known as the "Southern Medical Association's Special Train," which will leave St. Louis, at 9 a. m., Tuesday, June 19th, and, after stopping at several places, will reach San Francisco at 5:45, June 24th. For fares, Pullman rates, schedule or other information, write "Southern Medical Association, Empire Building, Birmingham, Ala."

The Southampton County (Va.) Medical Society

Met at the home of Dr. R. L. Raiford, in Sedley, May 3. This meeting was largely attended and was most successful from a scientific point of view. At 2 p. m., there was a clinic at which time normal and subnormal children were examined. This was followed by a paper on "Nutritional Disorders of Childhood," by Dr. Franklin D. Wilson, of Norfolk. Later there was a reception at which there were five minute talks on "The Aims of

our County Society," by the president, Dr. E. F. Reese, Courtland; on "The Co-operation of the Medical Profession: With the Church," by Rev. Nathan Pickett, Sedley; "With the Public School System," by R. M. Newton, Superintendent of Public Schools of the County; "With the Board of Public Welfare," by Miss Mary Babb, Superintendent of the Board of Public Welfare; and "With the General Public," by Paul Scarborough, Editor of the *Tidewater News.* It is thought that much good will result from this meeting.

Dr. Dunn Resigns Professorship.

Dr. John Dunn, Richmond, has tendered his resignation as professor of otology, rhinology and laryngology at the Medical College of Virginia, effective at the end of this session, and was by unanimous vote chosen professor emeritus of this branch. Dr. Dunn was connected with the faculty of the former University College of Medicine from its organization in 1893 and has been a member of the faculty of the Medical College of Virginia since the consolidation of these two medical schools in 1913.

It is announced that Dr. Joseph A. White, now professor of ophthalmology, will have charge of the combined chairs of ophthalmology, otology, rhinology and laryngology, next session.

Dr. Dean B. Cole,

Richmond, has been called to Chilhowie, Va., on account of the illness of his father.

Celebration of Pasteur's Centenary.

A number of physicians from the United States are planning a tour of France between July 11 and August 18. Because this is the time of the celebration of Louis Pasteur's centenary, this visit is being sponsored by the French government and participants will have free access to many highly interesting social functions not ordinarily open to visitors. It is possible to leave New York as late as July 4 to join this party. The trip is to include visits to many places of unusual interest.

If interested, write for full details, addressing L. J. Garcey, General Agent, Railways of France, 281 Fifth Avenue, New York City.

West Virginia Medical Association.

Don't forget the dates of the West Virginia Medical Association are June 12, 13 and 14, and the place Beckley. A most cordial invitation has been extended all members of the Medical Society of Virginia as well as other medical associations to attend. It is likely that several pullman parties may be made up from Virginia. If you expect to attend, communicate with Dr. Charles S. Smith, Beckley, W. Va., secretary of the Raleigh County Medical Society for details as to the meeting.

Box for State Health Department Supplies Furnished Physicians.

In order to facilitate the collection of reports of contagious diseases and other vital statistics by county health officers so that they may more quickly apply preventive measures, the State Health Department has sent to each physician, in counties having organized health departments, attractive boxes containing report cards and forms, mailing cases for collecting and sending specimens to the State Laboratory, and a copy of the revised rules and regulations. Inside the lid of each of these boxes is a synopsis of public health laws and a list of supplies furnished by the State Board of Health. Having these health department supplies all in one place should prove a convenience to the doctors and a great aid in promoting prompt reports. These boxes, while prepared primarily for physicians in counties where there are whole time health officers, are available, on request, to other physicians, as long as the present limited supply lasts.

Malaria Control.

Pursuant to a change of plan in malaria control work, the counties of Accomac, James City, Princess Anne and Henrico have accepted the financial aid of the State Board of Health in co-operation with the International Health Board in establishing whole time county health units. These units began operation on May 1, each with a personnel consisting of a medical health officer and public health nurse. Two of these counties have a sanitary officer. These units will feature malaria control.

Dr. B. B. Bagby, recently of West Point, Va., will have charge of the work in Henrico County, with headquarters in Richmond; Dr. John O. Gaston, of Rochester, Mich., will be in charge of work in Accomac County, with headquarters at Accomac; Dr. J. L. Sanford, of Clifton Forge, will look after the work in Princess Anne County, with headquarters at

Oceana: and Dr. J. H. Crouch, of Smithfield, Va., will look after the work in James City County, with headquarters at Williamsburg. All entered upon their duties May 1.

Dr. Malcolm Hart Harris,

Of Pendletons, Va., located in West Point, Va., the first of May, and will take up the practice of Dr. B. B. Bagby, who has entered the malaria control work in Virginia. Dr. Harris is a graduate of the class of '22, Medical College of Virginia, and has for the past ten months been an assistant physician at Southwestern State Hospital, at Marion, Va.

Dr. Hunter McGuire

Returned to his home in Richmond, the latter part of April, after a pleasure visit to Philadelphia.

Dr. and Mrs. J. J. Kindred,

Of New York, recently visited their son, who is a student at Randolph Macon College, Ashland, Va. Dr. Kindred is a native of Southampton County, this State, and has many friends in Virginia.

Dr. M. L. Dalton,

Recently of Floyd, Va., has located at Hinton, W. Va., where he will continue the practice of his profession.

Dr. William M. Sheppe,

Who has been instructor in pathology and bacteriology at the University of Virginia, is now at Ohio Valley Hospital, Wheeling, W. Va.

Doctors With Richmond Rotarians.

Dr. Charles R. Robins has been elected a member of the board of directors and Dr. Greer Baughman has been appointed a member of the Program and Entertainment Committee of the Richmond Rotary Club.

The Woman's Auxiliary to the Richmond Academy of Medicine and Surgery

Was organized at a meeting held at the home of Mrs. J. Allison Hodges, in this city, on May 2nd. Sixteen ladies were present and they were enthusiastic in their endorsement of the Auxiliary. Officers elected are: County chairman, Mrs. Ramon Garcin; City chairman, Mrs. Francis W. Upshur; vice-presidents, Mrs. C. E. Llewellyn, Mrs. J. Blair Fitts and Mrs. Thos. Wheeldon; secretary-treasurer, Mrs. Arthur S. Brinkley. Committees were appointed to assist in the various phases of work to be undertaken by the Auxiliary.

The American Association of Pathologists and Bacteriologists,

At its annual meeting held recently in Boston, elected Dr. Theobald Smith, Princeton, N. J., president, and Dr. Howard T. Karsner, Cleveland, secretary. At this meeting the custody of the cane was conferered upon Dr. William H. Welch, of Baltimore. Dr. Harold C. Ernst, of Boston, the first recipient of the cane, before his death in 1922, conceived the idea of conferring the custody of the cane for lifetime in recognition of the services of those who represent the best in the traditions of medicine. Dr. Welch is the second recipient of this honor.

D. Charles E. Conrad

Has returned to his home in Harrisonburg, after a visit to Atlantic City, where he spent some time recuperating from a recent illness.

Dr. B. P. Seward,

Of the class of '22, Medical College of Virginia, who has been an interne in Stuart Circle Hospital, Richmond, since July 1, 1922, will be associated in practice with Dr. W. W. Seward, at Surry, Va., beginning next July.

Dr. R. W. Garnett

Has been re-elected city health officer of Danville, Va., for a period of two years.

Miss Rose Z. Van Vort,

Superintendent of Stuart Circle Hospital, was recently elected president of the Richmond Nurses' Clubs.

Dr. W. Harman Evans,

Lynchburg, Va., was badly bitten by a German police dog, last month, when he went to make a professional call several miles out of the city. The dog attacked Dr. Evans, knocked him down three times and severely hurt his left arm and right leg, before Dr. Evans was able to catch and hold him until he could get help.

Dr. W. P. Hoy,

A member of the board of directors of the Rotary Club of Petersburg, Va., has been elected manager of the Rotary baseball club of that city.

Dr. E. C. Harper,

Who has been connected with the medical staff at Catawba Sanatorium, Va., is now located at Fries, Va.

Dr. H. D. Ribble

Has returned to his home, Sandy Mound Farm, just outside of Blacksburg, Va., after being out of the State since last November.

Dr. Willim H. Higgins

Became head of the Medical Department of St. Elizabeth's Hospital, Richmond, April 1, 1923. He gives a few hours in the afternoon to this work. While Dr. Higgins is attending physician to St. Elizabeth's Hospital, he will, of course, continue his private practice as heretofore, with offices in the Professional Building.

New Hospital Wing at University.

Contract has been let for the immediate erection of the $115,000 wing at the University of Virginia Hospital and it is planned to have it ready when the University opens in September. This wing will be immediately south of the present hospital buildings and will conform to the Steele wing on the north. This new building is made possible at this time by a gift from Paul Goodloe McIntire. This new wing is to house the obstetrical and orthopedic departments of the hospital and will provide sixty-three beds in addition to two nurseries, one for white and one for colored children. The moving of these departments from the main hospital building will give more room there for general cases.

Dr. R. E. Booker

Has returned to his home at Lottsburg, Va., after a vacation of several weeks spent in Florida.

Dr. A. I. Dodson

Has opened offices in Professional Building, this city, for the practice of urology, and will have office hours from 5 to 7 P. M. and by appointment. He will, however, continue his association, as before, with St. Elizabeth's Hospital and Dr. J. Shelton Horsely.

Public Health Institutes.

Such general interest was manifested in the venereal disease institutes conducted by the U. S. Public Health Service, that the Service now contemplates the establishment of institutes for supplementary training in the field of preventive medicine. It is proposed to establish one or more such institutes, of six to eight weeks' duration, at important medical centers or at Washington, the subjects to be decided upon later. An institute of the character proposed would aim to stimulate up-to-date intensive training for all persons engaged in various kinds of public health work; it would provide up-to-date instruction which would enable practicing physicians to deal effectively with the more important causes of mortality and disability; and it would bring together practicing physicians and health officers and so establish a more co-operative relationship in the work of disease prevention.

Married.

Dr. Charles Young Bidgood, Baltimore, Md., and Miss Mary Taylor Carrington, Danville, Va., April 21. Dr. Bidgood is an alumnus of the University of Virginia, being a member of the class of '20.

Lt. William Harvey Whitmore, M. C., U. S. N., and Miss Harriet Weiss Angeny, Philadelphia, April 5. Dr. Whitmore was formerly of Lynchburg, Va., and a member of the class of '16, University of Virginia, Medical School.

The American College of Physicians,

Meeting in Philadelphia, April 6 and 7, elected Dr. Harlow Brooks, New York, president, and Dr. Frank Smithies, Chicago, secretary.

The Tennessee State Medical Association,

In annual session in Nashville, in April, elected Dr. Hampton L. Fancher, Chattanooga, president, and Dr. Jos. F. H. Gallagher, Nashville, secretary. The next meeting is to be held in Knoxville.

New Professor at Jefferson Medical College.

Announcement is made of the election of Dr. Withrow Morse, professor of physiological chemistry in the West Virginia University School of Medicine to the position of professor of physiological chemistry and toxicology in Jefferson Medical College. Dr. Morse is recognized as a man of ability and Jefferson College is fortunate to have secured his services.

American Society for the Scientific Study of the Medical Aspects and Treatment of Cancer.

It has been proposed by a number of phy-

sicians to form an association for the above purpose and Dr. L. Duncan Bulkley, 5 East 53rd Street, New York City, has been requested to issue a call to those especially interested in cancer to get together and form such an association. It has been decided to hold this organization meeting in San Francisco, doing the meeting of the American Medical Association, June 25-29. At this time, the plans, scope, details, and name of the association could be worked out and the organization effected.

Even if you cannot attend the organization meeting, please advise Dr. Bulkley, at the above address, if you are in sympathy with the work and would accept membership in the Society when it exists.

Dr. and Mrs. Edwin B. Claybrook,

Cumberland, Md., recently visited relatives in Richmond.

Surgeon General Hugh S. Cumming,

Of the U. S. Public Health Service, by invitation addressed the Woman's Club of Richmond, Va., on April the 30th. His talk related to the part the Federal government should play in the direction of health work in the various states. He paid high tribute to Virginia's chief health executive, Dr. Ennion G. Williams, and to Dr. E. C. Levy, director of public welfare of Richmond, and their co-workers.

Dr. A. D. Tyree

Has moved from Fireco, W. Va., to Clifton Forge, Va.

Dr. Newton G. Wilson,

After practicing for sometime at Fieldale, Va., has located at Hendersonville, N. C.

Statistical Data Concerning Personnel of Medical Corps of Army.

In a recent issue of *The Army Medical Bulletin* appeared an article on the above subject which was of more than passing interest. In this it is noted that the average age of Colonels of the Medical Corps of the Army is 53.3 years; of Lieutenant Colonels, 47.7 years; of Majors, 40.1 years; and of Captains and Lieutenants 36.6 years.

The University of Pennsylvania has the honor of having furnished more medical officers in the Army than any other medical school; Jefferson Medical College holds second place, with the University of Maryland and the University of Virginia in the third and four places, respectively. The University of Virginia has 45 medical officers now in the Army, and the Medical College of Virginia 15.

As to the state of nativity, Virginia holds third place, with a total of 62 native Virginians in the medical service of the Army. Pennsylvania and New York hold the first and second places with 111 and 99 representatives, respectively.

Dr. and Mrs. B. M. Rosebro

And several friends, of Richmond, motored to Sweet Briar College, where their daughter is a student, to attend May Day exercises.

The Medical Society of the State of North Carolina

Held its annual meeting in Asheville, in April, with a very large attendance. Dr. J. V. McGougan, Fayetteville, was elected president for the ensuing year, and Dr. L. B. McBrayer, Sanatorium, was re-elected secretary-treasurer.

Dr. Frederick W. Rankin,

Formerly of Mooresville, N. C., but recently of the Mayo Clinic, has been appointed professor of surgery in the University of Louisville, Medical School.

Dr. and Mrs. S. E. Weymouth,

Callao, Va., left the middle of April for an extended visit to Baltimore and points farther north.

Improvements at Pine Camp, Richmond.

With an appropriation of $125,000 from the city and a gift of $15,000, extensive improvements are being made at Pine Camp, Richmond's municipal tuberculosis sanitarium. The new buildings and changes in the old sanitarium are about complete and the result is that in the late summer, Richmond will have possibly the best municipal tuberculosis sanitarium in the United States. When completed, there will be accommodations for ninety-two patients instead of thirty-six, as at present. Dr. E. C. Levy, director of Public welfare, of Richmond, has been active in his work for the success of this institution. Dr. W. Nelson Mercer is chief visiting physician and is assisted by Drs. P. D. Lipscomb, G. A. Ezekiel and Wyndham B. Blanton as associate physicians, while

the consulting staff includes Drs. Dorsey G. Tyler, W. L. Mason, Henry S. Stern, R. Finley Gayle, J. Blair Fitts, Thos. S. Wheeldon, Ward H. Cooke, Joseph Bear, and J. L. Tabb, Jr.

Pine Camp established in 1910 and was first sponsored principally by the ladies of Ginter Park. The city took over the camp in 1915 and, since that time, improvements have been made as rapidly as finances permitted.

Medical Examinations for Golfers.

Dr. Matthias Nicoll, Jr., Deputy Health Commissioner of New York State, himself an enthusiastic golfer, in a bulletin issued recently states that there is no question that "golf may be and often is overdone." He accordingly suggested a few rules, applicable especially to the older golfers, and states that any one who can afford to play golf should be able and willing to pay for an annual scientific medical examination. There is no doubt of the fact that Dr. Nicoll's views should receive a recognition which the golf enthusiast may hardly wish, on first thought, to accord them.

The American Gynecological Society

Is to hold its annual meeting at Hot Springs, Va., May 21-23, under the presidency of Dr. John Sampson, of Albany, N. Y. Dr. A. H. Curtis, of Chicago, is secretary.

McGuire Cot at Hospital.

In memory of the late Dr. Edward McGuire, of this city, a cot was installed at Crippled Children's (Dooley) Hospital, Richmond, on the afternoon of May 8.

Dr. and Mrs. John A. Gibson,

Leesburg, Va., returned home about the first of May from a visit to Victoria, Va.

The Valley Medical Society

Meets in Winchester, Va., May 31. Dr. Hunter H. McGuire, Winchester, is president, and Dr. A. F. Roberston, Jr., Staunton, secretary.

Dr. Payne to be Virginia Epidemiologist.

Dr. Geo. C. Payne, of the International Health Board, has been appointed Virginia Epidemiologist and will shortly enter upon his duties in this State. He will, however, retain his connection with the International Board, coming to Virginia through the courtesy of that organization. Dr. Payne is at present doing post-graduate work in the Johns Hopkins School of Hygiene and Public Health and will come to Virginia immediately after securing his degree as Doctor of Public Health, in June.

Undergraduate School of Nursing at Yale University.

The first university undergraduate school of nursing in the United States is to be established at Yale University, New Haven, Conn. The school is to have its own dean, faculty, buildings and budget, and the funds for its maintenance will be provided by the Rockefeller Foundation. It is planned to have the course cover about twenty-eight months.

The Virginia Public Health Association

Was reorganized at a meeting held in Richmond on April 17. Dr. W. B. Foster, Roanoke, the former president, presided. Dr. P. S. Schenck, Norfolk, was elected president; Dr. Roy K. Flannagan, Richmond, and Dr. W. S. Keister, Charlottesville, vice-presidents; Dr. L. L. Roper, Portsmouth, secretary-treasurer.

Over 300 persons actively interested in health problems throughout Virginia have signified their intention of joining the Association. Two meetings will be held each year.

Doctors in Virginia National Guard.

The Federalized National Guard of each State now constitutes, with the regular army, the first line of defense of our country and, as evidence of their patriotism and belief in preparedness for a national emergency, the following Virginia physicians have been commisioned in the Virginia National Guard:

In Richmond, Col. J. Fulmer Bright, Majors W. Nelson Mercer and John Blair Fitts, Captains Thomas F. Wheeldon and Ernest T. Trice.

In Danville, Major Henry A. Wiseman, Captains Clyde L. Bailey, Claude N. Rucker and Garnett W. Johnson.

In Norfolk, Captains Harry W. Boice and Albert V. Crosby.

In Roanoke, Captain Ira H. Hurt.

In Lynchburg, Captain James R. Gorman.

In Petersburg, Captain Herbert L. Wyatt.

Dr. Louis L. Williams, Jr.,

Who has been engaged in malaria control work with the Virginia State Health Department, has been designated to represent the United States on the epidemic committee of the league of nations. Twelve countries will be represented on the committee. Dr. Wil-

liams left the first of this month for Italy, where he will spend four months studying malarial problems.

Medical Aid Needed for Russia.

An appeal comes from the American Medical Aid for Russia for food, clothing, instruments, supplies and medical books for the physicians of Russia, as well as for financial help to maintain their hospitals and help care for the complicated health problems of that country. Dr. Henry O. Eversole, a member of the Commission on Russian Relief, has sent advance information on the report of the Health Section of the Commission, showing that conditions are deplorable and help is badly needed. Great effort is being made to control epidemic diseases which are ravaging that country, but one of the most serious problems which confronts the medical profession is the care of millions of children whose health has been damaged by adverse social and economic conditions. Hospitals have been taxed to the utmost to meet epidemic situations and there is now a great lack of necessary equipment and supplies. Dispensaries which are running are hampered by lack of even the simplest drugs.

Some of the best known medical men in the United States are members of the Physicians' Committee of the American Medical Aid for Russia and endorse its work. Supplies or money should be sent this organization at either 1521 Cherry Street, Philadelphia, Pa., or 108 Dobbin Street, Brooklyn, N. Y. The American Medical Aid for Russia promies to apply all contributions to the relief of Russian institutions and medical personnel, without deduction for administration and transportation charges.

Course in Physiotherapy.

The next course in physiotherapy which will be given at Walter Reed General Hospital, will begin October 5, 1923, and continue for four months. For information apply to the Commanding Officer, Walter Reed General Hospital, aWshington, D. C.

The American Congress on Internal Medicine,

Which convened in Philadelphia, April 2, elected Dr. Elsworth Smith, St. Louis, president, and re-elected Dr. Frank Smithies, Chicago, secretary-general.

Civil Service Examinations.

Examinations will be held throughout the country on June 6, for men and women, to fill vacancies for trained nurse and trained nurse (psychiatric), in the Panama Canal Service. Full information and application blanks may be secured from the U. S. Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. Civil Service Examiners at the postoffice or custom house in any city.

Incidence of Diphtheria in City and Country.

From investigations recently made by Dr. C. W. Kidder, of the U. S. Public Health Service, the following conclusions are deduced: that the susceptibility to diphtheria is higher among persons living in rural sections than among those living in cities; that it is much higher among the well-to-do than among the poor; and is more often found among the native born than among the foreign born. In view of the above, the Service stresses the value of the Schick test in determining those who are susceptible, thus enabling them to be immunized by the toxin-antitoxin. Particularly should this be a routine in the rural regions, where the degree of susceptibility was found to be greatest and where facilities for prompt and adequate treatment are frequently lacking.

Dr. J. Gordon Boisseau

Has been named post commander of Post 151, American Legion, organized in Richmond, Va., early this month.

The Virginia State Dental Association,

At its annual meeting held in conjunction with that of the North Carolina Dental Society at Pinehurst, the first part of this month, elected Dr. C. B. Gifford, of Norfolk, president, and re-elected Dr. Harry Bear, Richmond, secretary-treasurer. The Virginia Association will hold its next meeting during the Spring of 1924 in Norfolk, Va.

New Hospital at Stuart, Va.

Dr. George T. Divers has placed contract for a new hospital to be erected at Stuart, Va., on the site of the Mother's Home, which was owned and operated by the late Dr. R. S. Martin. The building is to have four stories, will be modernly equipped and fireproof, and will have a capacity for thirty patients. It is expected that it will be ready for occupancy in August.

Dr. L. T. Royster,

Norfolk, Va., was elected one of the vice-presidents of the Virginia Conference of Social Workers, recently held in Charlottesville, Va.

Dr. M. H. Eames,

Lanexa, Va., was a recent visitor in this city.

Broadcasting Public Health by Radio.

The radio has now become a popular means of disseminating public health information. It is stated that broadcasting stations are so situated as to serve practically every portion of the United States. It is estimated that there are now more than 2,000,000 radio receiving sets within range of stations which release health bulletins. In this way health news is scattered with practically no additional expense to the Public Health Service.

The American Drug Manufacturers

Held their twelfth annual meeting in New York City, April 16-19. Important matters relating to narcotic drug regulations, legislation, pharmaceutical prograss, scientific research, medicinal chemicals, etc., were discussed. Mr. A. S. Burdick, President of the Abbott Laboratories, Chicago, was elected president, and Mr. A. Homer Smith, of Washington, D. C., Secretary.

Deaths of Physicians.

The Journal of the A. M. A. reported deaths of 2,513 physicians during 1922, and, adding three per cent. for possible omissions or delayed reports, it is estimated that the total was 2,588. This rate of 17.73 per thousand was slightly higher than the 15.52 per thousand average for the previous twenty year period. The greatest number of deaths for a given age was at 66 years, at which age eighty-eight deaths were noted, and the largest number were due to diseases of the heart and circulatory system.

Doctor!

Do you want to locate in Tennessee? City of 4,000, eighty miles south of Nashville on L. & N. R. R. One of richest counties in State. Want to sell out and quit practice. $4,500 cash to handle. Beautiful home and well-equipped office. Write for particulars to Dr. James A. LaRue, Pulaski, Tenn. (Adv.)

Obituary

Dr. McGuire Newton,

Distinguished pediatrist and one of the most beloved doctors of Richmond, both by the profession and his clientele, died May 8th, after an illness of about seven months. His death was due to unusual heart complications accompanying inflammatory rheumatism. He was a son of the late Bishop John Brockenborough Newton and Mrs. Roberta Page Williamson Newton, and was born in this city 47 years ago. He graduated from the University College of Medicine, Richmond, in 1897, and joined the Medical Society of Virginia in 1898. Several years later he decided to limit his work to pediatrics and he had become one of the leading specialists in this branch in the country.

Dr. Newton was for some years professor of pediatrics at the University College of Medicine and, when that school combined with the Medical College of Virginia, he was placed in charge of the same branch in the consolidated schools. He was active in church and charity work, was an ex-president of the Richmond Academy of Medicine and Surgery, was a vice-president of the Medical Society of Virginia in 1910, and later a member of its executive council. He was also a member of the State Board of Health. He was prevented by the condition of his heart from entering the medical service during the World War, but continued his work at home with patriotic zeal. He was unmarried but is survived by a sister and several brothers.

Dr. Samuel Lile,

A prominent physician and surgeon of this State, died suddenly at his home, Lynchburg, Va., April 15. Dr. Lile was about sixty-two years of age and had practiced in Lynchburg for about twenty-five years. He studied medicine at the University of Louisville, from which he graduated in 1888. He joined the Medical Society of Virginia in 1894 and was much interested in its welfare, having been elected president in 1914. He was also an active church worker. Dr. Lile is survived by two daughters, his wife having died several years ago.